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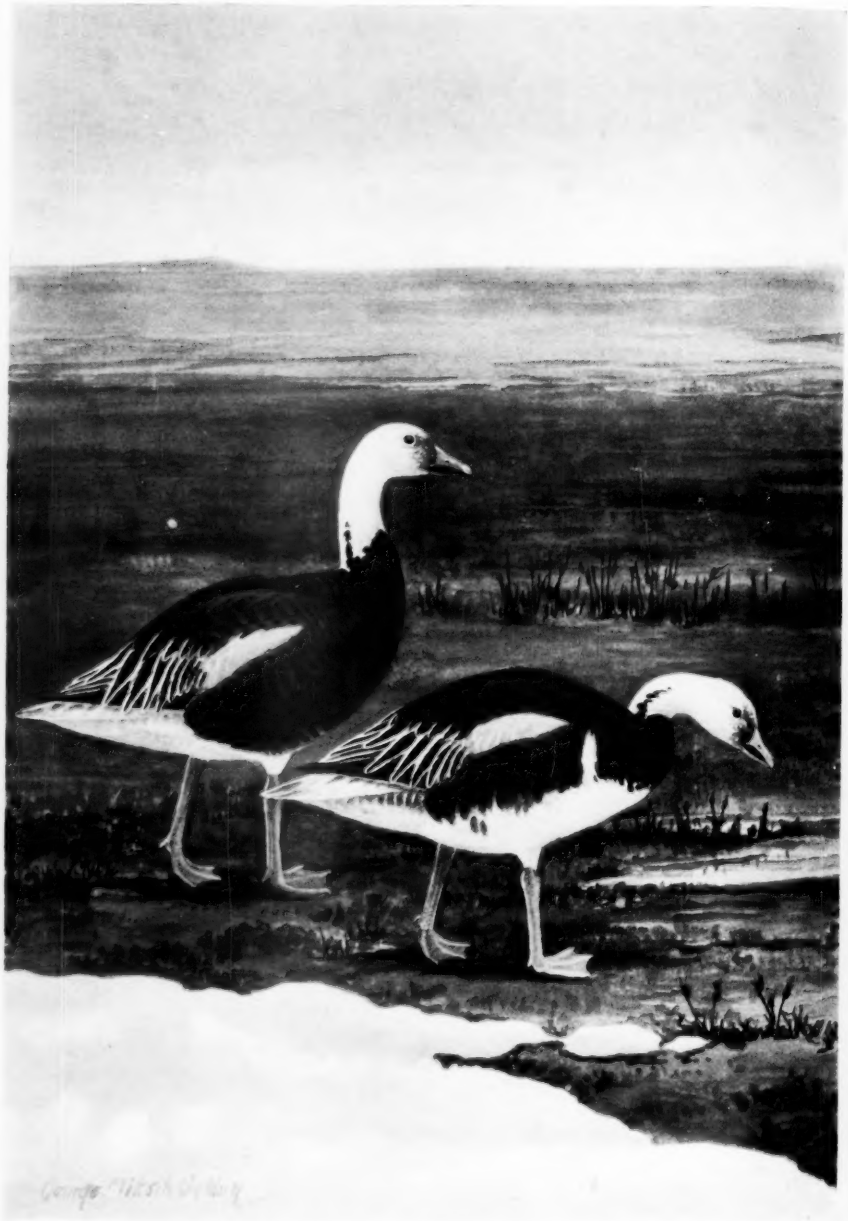

Blue Geese on their Southampton Island Nesting-Ground. The Female (right) is A Hybrid Blue × Lesser Snow Goose.

[From Painting by George Miksch Sutton.]

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THE BLUE GOOSE AND LESSER SNOW GOOSE ON SOUTHAMPTON ISLAND, HUDSON BAY.[1]

BY GEORGE MIKSCH SUTTON.

THE Blue Goose, *Chen caerulescens* (Linnaeus), has for decades been a much discussed water-fowl. The fact that its nesting range and migration routes remained so long unknown in spite of its great abundance in winter at the mouth of the Mississippi River made it a creature of considerable mystery to sportsman and scientist alike. Some of this mystery has been dispelled, to be sure, with Mr. Dewey Soper's[2] finding of a large breeding colony on Baffin Island; but for those of us who have been interested in the status and racial history of the species, and who have been actively engaged in the study of it in the field, some of the mystery yet remains. Some of us still wonder whether the summer range of the bird can possibly be as restricted as at present it appears to be; and in our study we find ourselves deeply interested in its relationships with the obviously closely allied Lesser Snow Goose, *Chen hyperborea hyperborea* (Pallas), with which it is associated apparently during its entire existence, both in summer and winter and on migration.

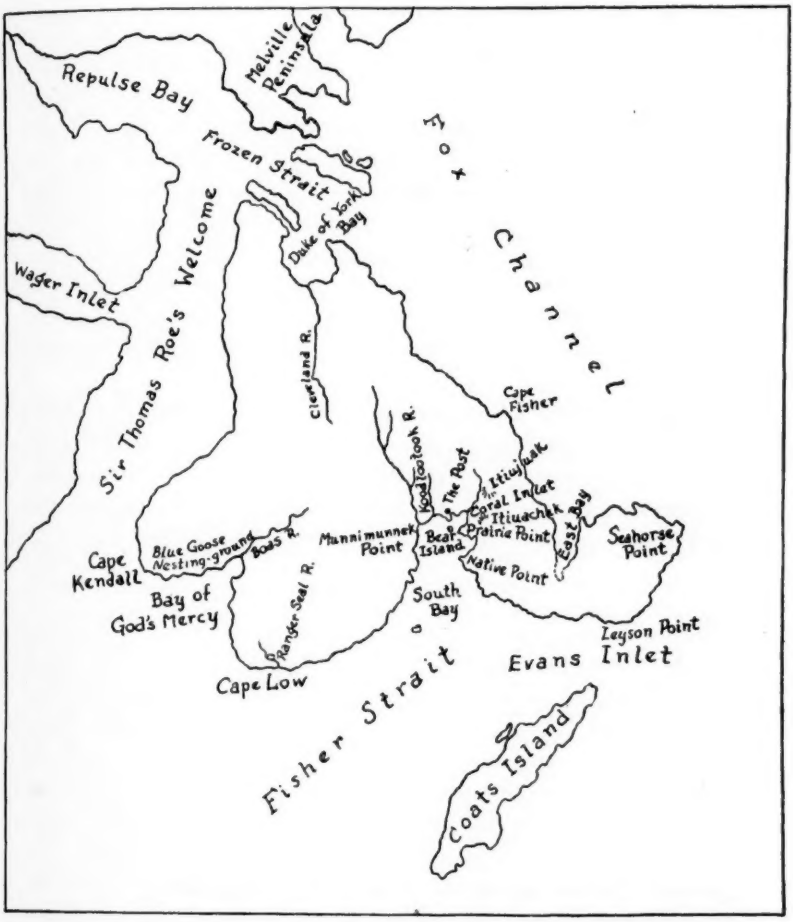
[1] The author wishes to thank the following persons for assistance in the preparation of this manuscript: Dr. Arthur A. Allen and Prof. A. C. Fraser of Cornell University, Ithaca, New York; Mr. W. E. Clyde Todd, of the Carnegie Museum, Pittsburgh, Pa.; Mr. Percy A. Taverner of the National Museum, Ottawa, Ontario; Mr. Frederic H. Kennard, of Newton Centre, Massachusetts; Mr. Richard C. Harlow, of Westminster, Maryland; Mr. Olin S. Petingill, Jr., of Middleton, Massachusetts; and Mr. George B. Saunders, Jr., of Oklahoma City, Oklahoma.

[2] J. Dewey Soper, The Blue Goose [*Chen caerulescens* (Linnaeus)] An Account of its Breeding Ground, Migration, Eggs, Nests and General Habits. Bulletin of the Department of the Interior of the Dominion of Canada, Ottawa, 1930, pp. 1–64, with maps and many illustrations.

Mr. Soper has published a most welcome account of the bird on its nesting ground, together with a résumé of its known life history. In this account we are given the first definite information as to its breeding range and nesting habits, and data regarding its migration are correlated so as to make clear its annual program, at least so far as the Baffin Island birds are concerned.

It was my good fortune in the spring of 1930 to have a part in the discovery, on Southampton Island, Hudson Bay, of a second breeding ground of the Blue Goose, five or six hundred miles to the westward of that found by Soper. In order to make a complete study of the bird-life of Southampton it was necessary to spend the entire year there, from August 17, 1929 to August 16, 1930. This I was able to do through the generosity of Mr. John Bonner Semple of Sewickley, Pennsylvania, the coöperation of the Department of the Interior of the Canadian Government, and the assistance and interest of the famous Hudson's Bay Company of London. A final report on the ornithological collections made and data gathered will appear later, in the 'Annals of the Carnegie Museum of Pittsburgh'. The finding of this additional Blue Goose breeding ground follows so closely upon Soper's discovery, however, and the behavior of the bird was found to differ so markedly in some essentials from that observed by Soper on Baffin Island, that the present paper is offered in advance of the final report.

Southampton Island is situated at the mouth of Hudson Bay, somewhat nearer the western than the eastern shore. It has an area of 19,000 square miles and is the largest of the islands of Hudson Bay. Its most northerly point lies just a little south of the Arctic circle. The eastern half of the Island is rough and rocky, the granitic ridges which parallel the shore of Fox Channel reaching their highest point at Mount Minto, which is said to have an altitude of 1050 feet. The western half of the Island, on the other hand, is exceedingly flat, the region of Cape Low and Cape Kendall having a tiresomely monotonous sky-line. Along the entire coast of Southampton there are numerous lakes, some of them of considerable size. Much of the country between these lakes is covered generously with grass during the summer, and here great numbers of birds of many species find an almost ideal nesting ground.



Sketch-Map of Southampton Island, Hudson Bay, showing the localities referred to in the present paper. Scale about seventy miles to the inch.[1]

The race of Eskimos which originally inhabited Southampton became extinct about thirty years ago as a result of an epidemic. This race was known as the Saglernmiut. The Eskimos living on

[1] This map is based upon maps published by Captain George Comer (Bull. Am. Geog. Society, Vol. XLII, 1910, p. 85), Captain H. T. Munn (Geog. Journal, Vol. LIV, 1919, p. 53) and Dr. Therkel Mathiassen (Archaeology of the Central Eskimos, 1927, p. 327).

the Island today are of two tribes—Aivilikmiut from the Repulse Bay country to the northward, and Okomiut from Baffin Island. At the time of my sojourn, there were one hundred and thirty-eight Eskimo men, women, and children living on the Island. There were also four white men, aside from myself: Mr. Sam G. Ford, Chief Trader of the Hudson's Bay Company and his son Jack, and Fathers A. Thibert and Eugène Fafard, Roman Catholic Missionaries of the *Pères Oblats* organization. All of these people, especially Mr. Ford and his son, helped me in my work, and one of the natives, Tommy Bruce (so-called) was of special assistance in collecting much of the Blue Goose material which I brought back with me.

Contrary to Soper's observations on Baffin Island, the Blue Goose and Lesser Snow Goose on Southampton were found to interbreed occasionally. It seems advisable, therefore, to consider each species independently of the other, before offering suggestions and opinions as to their ancestry, relationships and future status.

THE BLUE GOOSE.

Eskimo Name: The Aivilikmiut name for the Blue Goose was *Khavik*. Certain of the Southampton Island Okomiut also used the word *Khavik*, or a close equivalent, though the name for the species actually in use on Baffin Island, according to Mr. Soper (Ibid., p. 38) is *Kungovik*. *Khavik* and *Kungovik* are both, at least in part, onomatopoetic words, the first syllable being an imitation of the bird's characteristic warning cry. So far as I could learn, no Eskimo word for the species alludes in any way to its color.

Status: The Blue Goose is a locally abundant summer resident on Southampton Island. The largest breeding ground is near Cape Kendall, along the north shore of the Bay of God's Mercy. It also nests here and there, in isolated pairs, throughout the coastal lake-belt of the western part of the Island, but does not, according to our experience and to the reports of the natives, nest in the high country of the eastern part. It is my present opinion that all the Blue Geese which visit Southampton during the course of the year actually nest there; that is, that none of them stop on or fly over the Island en route to Baffin Island or other more northerly nesting grounds. According to Soper (Ibid., pp. 23–25) those which

nest on Baffin Island migrate northward probably only along the east coast of Hudson Bay.

Résumé of Fall Field Work: When I landed at Southampton Island in the late summer of 1929, I did not know that any nesting ground of the Blue Goose had been discovered, since, when the *Nascopie* called at Dorset, Baffin Island, Soper had not yet returned from the interior. Through Mr. Ford I immediately told the Eskimos, therefore, that data of any sort regarding the Blue Goose were of great value to me; and I was promptly assured that I had come to the right place for a *Khavik* nest.

On that very first day I was shown the well-preserved skin of an adult female Blue Goose which had been shot early in the preceding July, at Bear Island, in South Bay, by Jack Ford. The specimen was in full, though worn, plumage. There was no bare area on the belly, so I feel sure the bird had not been incubating eggs. The entire belly was dark in color, much of the plumage having a rusty-brown appearance. The head and neck were white, the lores and forehead being liberally sprinkled with rusty and the lower neck somewhat mottled with dark gray. According to the Eskimo woman who skinned the bird, the ovaries were enlarged; but none of the hunters would venture to affirm that the *Khavik* had ever nested on the half a square mile moss-covered expanse of Bear Island. The bird had been seen with another Blue Goose, however, and the Eskimos considered the two a mated pair.

Upon making inquiry, I found that all the natives who had travelled about on the Island were familiar with the extensive *Khavik* nesting grounds at Cape Kendall, and that both Mr. Ford and his son had seen many birds, both alive and dead, during the summer, and quantities of eggs which had been gathered for food. Every one seemed to regard the Blue Goose as regular and abundant, but decidedly local in distribution. I was told that the Eskimos were accustomed to making special trips to the western side of the Island every summer where they gathered box- and trunk-loads of goose and swan eggs. Formerly most of these trips were made to the Cape Low region; but during latter years the largest nesting colonies were thought to be in the vicinity of Cape Kendall.

Though the season was obviously too late for eggs or young birds, I decided to try to reach Cape Kendall as soon as possible, so as

to learn what I could of the late summer and fall conditions on the Blue Goose nesting ground. Accordingly, on August 27, Mr. Ford, Amaulik Audlanat (better known as John Ell) and I set out by motorboat for Cape Kendall. We found the entire southern coast of the Island dangerously shoal, and progressed with difficulty; but we finally made Cape Low. Owing to the lateness of the season, roughness of the weather, and absence of good anchoring places, we decided not to go on to Cape Kendall. At Cape Low we saw many Blue and Lesser Snow Geese.

On September 2, we camped at the mouth of the Ranger Seal River (a medium-sized stream called *Kashigiaksoak* by the Eskimos) only a few miles east of Cape Low. Here, according to Amaulik Audlanat, there had once been a colony of geese so vast that to one standing on the river bank the surrounding bird-filled tundras seemed to be covered with snow. I walked over much of the territory about this river and the nearby lakes, but found no trace of any such extensive nesting ground. I learned that in past years a great many eggs had been gathered by the Eskimos at this colony, but that few birds had been killed. I think it likely, therefore, that the geese had not been exterminated but that, due to fouling of the ground, or to diminution or change in the food supply, they had shifted their nesting grounds to the northward. Amaulik Audlanat told me that the geese were given to changing their breeding grounds thus, sometimes without any apparent reason. Assuredly they had not nested at Cape Low in any great numbers during the summer of 1929, for we found little trace of them there and subsequently learned that the Eskimos, during their mid-summer visit to the region, had not found more than a few scattered pairs.

Though we found no nests or undeveloped young, we saw great flocks of geese, most of them white. Noisy hordes of the great birds circled about restlessly, apparently searching a feeding ground, and then, after settling comfortably, rose with renewed clamor as though dissatisfied or alarmed. Obviously they were migrating. Probably few or none of these birds had nested at Cape Low. Among the snowy flocks were many dark-colored birds and a goodly proportion of these were adult Blue Geese, with white heads, but we collected no specimen. Although the two species mingled freely,

the Blues kept in small closely knit groups; and they did not always stay with the white geese either in flight or on their feeding grounds. I venture the guess that fully twenty-five percent of these flocks of migrants were Blue Geese, though it was impossible to distinguish satisfactorily the young of the Blue Goose from the young of the Lesser Snow.

The behavior of the two species was amazingly similar. Their call-notes, from the deep *kah, kah, kah* of warning, to the various gabblings and groanings of the feeding flock, or the high-pitched *whah, whah, kah, whak, whah* of the alarmed, winging birds were, as far as I could determine, identical.

On September 3, many Blue Geese were seen—probably four hundred birds in all, mingling with the hundreds of restless, wary, noisy Snow Geese. All the birds were busy feeding much of the time. They walked slowly about on the moss, nibbling at the grass. Part of the flock sometimes rested. At the merest hint of alarm, the nearer birds set up a loud calling, whereupon the entire flock began to gabble noisily and then to walk rapidly away, or to take flight in haste. The flocks were obviously gathering for migration. At about noon, we saw huge flocks of both Lesser Snow and Blue Geese flying southward or southeastward, headed, apparently, not for the nearest point along the western shore of Hudson Bay, but for Coats Island, less than a hundred miles away, where it may be they are accustomed to gathering before going on to James Bay.

Mr. Ford, who lived on Coats Island from 1919 to 1922, and later during part of the 1923–1924 period, believes that the Blue Goose did not nest on Coats Island during his residence there, though he saw them regularly in the fall. White geese weer, however, frequently seen in summer. Elsewhere in this general region where the Lesser Snow Goose nests the Blue Goose is likely also to occur and I am inclined to believe therefore that it may occasionally nest on Coats Island. The migration of Lesser Snow and Blue Geese from Southampton to Coats Island (providing this migration takes place regularly) suggests that these species may have inhabited Coats Island originally and thereafter spread over to Southampton, recapitulating their racial history to an extent by including Coats Island in their migration route. I do not have enough data to warrant any detailed attempt at explanation of the

migratory routes taken by these birds, but it is highly interesting that they do not make for the western shore of Hudson Bay direct from Cape Low or Cape Kendall, if they are interested *primarily* in reaching a territory which will furnish them contiguous feeding grounds as they pass to James Bay. I attempted to learn from the Eskimos more about the autumnal migratory customs of these species but could not gather much definite information.

I believe that we witnessed, on September 3, the departure of almost the last flocks of Snow and Blue Geese from the Cape Kendall region. Though the weather was not disagreeably chilly, nor had there been any heavy snowfall, yet the grass was brown and winter was obviously at hand. O. J. Murie (cf. Bent, Life Histories of North American Wild Fowl, 1925, p. 183) was told by natives that Blue Geese sometimes arrived from the north in the James Bay region as early as August. This date of departure, therefore, does not seem in any way unusual. All the young geese were evidently in full plumage, though among other species, such as the Snowy Owl, Black-bellied Plover, and Red-throated and Pacific Loons, half-grown or even third-grown young were noted. The great flocks were so restless and wary that it was evident they were eager to be off at the slightest excuse. Whether the Southampton Lesser Snow and Blue Geese regularly go direct to Coats Island, and whether, from Coats, they move westward, or southwestward to the coast of Hudson Bay, or whether indeed, they go eastward or southeastward, perhaps via the Belchers, and eventually on to James Bay, are questions which remain to be answered. At Cape Low, however, I received the definite impression that all the geese were moving eastward, rather than directly southward, and certainly not westward in leaving Southampton.

Résumé of Spring Field Work: During the winter, word reached me by radio that Soper had at last found a splendid colony of Blue Geese on Baffin Island. Inasmuch as the eggs and downy young of this species were now known to science, I was glad to adjust my plans for the coming spring so as to permit me to do more work in regions not so far from our base of supplies as Cape Kendall. I therefore decided to entrust the Cape Kendall Blue Goose expedition entirely to the capable, intelligent and very friendly Eskimo known as Tommy Bruce, who assured me he would get

THE BLUE GOOSE NESTING GROUND AT PRAIRIE POINT, SOUTHAMPTON ISLAND. ITIUACHUK IN THE BACKGROUND.

NEST AND EGGS OF LESSER SNOW GOOSE, PRAIRIE POINT, JUNE 20, 1930.

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me what I wanted. He watched me preparing specimens and thus learned how to skin birds. In early June, just after he and I had made a vain attempt to cross the highlands east of the Post to Fox Channel, he set out for Cape Kendall with dog team and komatik, taking his family with him.

Tommy Bruce did not reach Cape Kendall in time to witness the arrival of the Blue Goose, so he had no opportunity to check Mr. Ford's belief that it "always comes from the southwest in the spring . . . in flocks of 5 to 20 at times."[1] I made considerable inquiry among the Eskimos as to the direction of flight among the earliest *Khavik* flocks noted in the spring, but did not get a very satisfactory response. According to our own observations, at least some of the birds come in from Coats Island to the east. Others may come in from the south or southwest, as Mr. Ford has suggested, but this matter will have to remain unsettled for the present.

At Coral Inlet the first Blue Goose (one bird only) was noted on June 10, by the native boy Santiana. This bird was flying about with a flock of the small Richardson's Goose, *Branta hutchinsi* (Richardson),[2] which had come in from the southeast. On June 12, Muckik saw a large flock passing westward over Bear Island, and Jack Ford saw many small flocks milling about with the larger flocks of Lesser Snow Geese in the partly snowless plains at the foot of Itiujuak. One reason for lack of information as to the direction of flight of the incoming birds is that they sometimes fly very high and are not seen by anyone.

In my own field work about Coral Inlet and Prairie Point, I kept a constant lookout for Blue Geese, and though I occasionally saw a pair or small flock passing over, I did not locate any nesting birds until the middle of the summer.

On June 25, Jack Ford returned to the Post from a several days' trip to Prairie Point and the southward, bringing with him a set of six eggs which were, according to the natives who had been with

[1] This opinion, based probably upon reports of the Eskimos rather than upon personal observations, was expressed by Mr. Ford in a letter to Mr. Frederic H. Kennard of Newton Centre, Massachusetts, who has consented to my making reference to it here.

[2] The name *Branta hutchinsi* is used here since I am of the opinion that the little goose of the coastal lake belt is of a species distinct from the larger, inland-nesting form, the bird Mr. Taverner has called the Lesser Canada Goose, *Branta canadensis leucopareia* Brandt.

him at the nest, *Khavik* eggs. He had cared for them meticulously, and was delighted that he should be the first to bring in these rare treasures. When I learned, however, that one of the parent birds at this nest had been a 'white' goose, I came to the conclusion that the eggs were not of the Blue Goose at all—but of a rather unusual pair of Lesser Snow Geese. Unfortunately no specimens were collected with this set,—but I am now certain that these eggs are hybrid—the female (or, at least, the incubating bird), a Blue Goose, the male a Lesser Snow.

On July 9, Tommy Bruce returned to the Post from Cape Kendall, bringing with him eight Blue Goose skins, and nine eggs, three sets of three eggs, most of them slightly damaged. In reaching Cape Kendall he had had difficulties. The whole region was badly flooded, and there were such hordes of lemmings in the dry spots that the children had had to kill these mice before camp could be made. Their *tepik* was pitched amongst the birds. Tommy estimated[1] that there were between eight hundred and a thousand pairs of geese in the vicinity of his camp. The majority of these were Lesser Snow Geese; but there were fully three-hundred pairs of Blue Geese and a good many scattered pairs of small Richardson's Geese as well as some Brant, *Branta bernicla hrota* (Müller). The Lesser Snow and Blue Geese nested side by side everywhere in the vicinity, usually on the higher stretches of land between the shallow lakes. On June 15, nearly all the Blue Goose nests held from one to three eggs, but were so sparsely lined with down that Tommy could not find any which he considered representative, so did not collect any. Several sets with a runt egg were found, and one of these sets was collected. Tommy told me that he had seen nests of the Blue Goose containing five and six eggs during previous years, but that he did not find any during 1930. As will be ex-

[1] I think it only accurate in this connection to call attention to the fact that the Eskimos are sometimes given to exaggeration when they feel that such exaggeration will produce a pleasurable effect. Actually friendly, and eager to please the visitor in their midst after he has proved to them that he is genuinely interested in their world and its activities, they sometimes over-state a matter a little so as to make him feel that his coming to an inhospitable land has not been in vain. Tommy Bruce's estimates may, therefore, have been a little high, though I talked to him many times about the matter and his comments were consistent. I am not sure, however, that even the most intelligent Eskimo has much conception of counting beyond one hundred, so even though I tried to get the most accurate information possible, the figures may be somewhat high.

plained later, these unusually large sets may have been laid by females of hybrid origin.

Among the possible one thousand pairs of geese observed near his camp near Cape Kendall, Tommy Bruce estimated that there were twenty pairs which represented definite interbreeding of the two species, where one parent was distinctly white, the other distinctly 'blue.' There were also several pairs of Blue Geese where one of the birds had considerable white blotching on the upper part of the breast (see color-plate), or where the whole region of the belly, rump, and even of the back was white. These white-bellied birds were fairly common, and one such specimen was included among the eight skins brought back from the colony.

Tommy should have used salt in preserving the skins; but the salt had been lost, I believe, in crossing a river. The specimens had been neatly skinned and stuffed with grass without any preservative whatever, and, since the *tepik*[1] had frequently been damp, and the weather at times warm, the skins were tainted. They had been carefully sewn up, their feet neatly crossed and tied, and strangely illegible, square, paper labels actually attached! The eggs, contrary to my advice, had been crudely blown. Nails had been used as drills and straws as blow pipes. Nevertheless they were Blue Goose eggs, and I got a definite thrill in unpacking them from their rough, moss-filled crate.

On June 20, some of the Okomiut men also visited the Cape Kendall colony and gathered numbers of goose eggs. They also found the Blue Goose about half as common as the Lesser Snow, and noted that in the nests there were usually fewer eggs than in those of the Snow Goose. Many of these eggs were brought to the Post loosely packed. It was painful to gaze upon these piles of cracked eggs—among them hopelessly mixed up sets of highly desirable species. These eggs, too, had been relatively fresh when gathered.

There is no way of precisely defining the Cape Kendall colony since it extends for miles along the north shore of the Bay of God's Mercy. The natives said they couldn't visit all the nests because they got "tired of wading through the lakes." It is interesting to

[1] The *tepik* is a summer tent formerly made of walrus or seal hide, but now frequently made of canvas.

note that, according to Tommy Bruce, there were no Whistling Swans or Little Brown Cranes in the entire region occupied by the Geese. It is also interesting to note that Captain George Francis Lyon (A Brief Narrative of an Unsuccessful Attempt to Reach Repulse Bay, 1925), Captain George Comer, who journeyed about in the region from 1896 to 1920, and A. P. Low (Cruise of the Neptune, 1906) do not mention the Blue Goose in their writings, though all three of these men were to some extent acquainted with the Cape Kendall region. Low includes the Lesser Snow Goose in his list (p. 317), but neither Lyon nor Comer makes any special mention even of this conspicuous species.

On July 12, I saw two Blue Geese which I thought were a mated pair, flying near the Post eastward toward the head of Coral Inlet. I decided at the time to make a special attempt to cover the region toward which the birds seemed to be flying. Two days later, I walked about eight miles from the Post, and reached an interesting region where several Richardson's Geese, a pair of Brant, and a pair of Blue Geese were nesting. There were also two other geese, a Lesser Snow and a Blue which were apparently mated, but whose nest was not found.

The Blue Goose nest contained four eggs which I collected for I feared I should not be successful in returning to procure the downy young. The nest was built of rather fine grass, lined with down and feathers, and placed among grasses and low willows not far from the edge of a lake, about four miles inland from salt water. The female, which was somewhat blotched with white below, left the nest while I was yet some distance away, and joined her mate, a normally colored bird, at the edge of the lake whence they both flew off, yapping and cackling noisily. They were very shy and I could not get anywhere near them. I waited for some time for them to return but they always flew high above me in swinging over the nest, and I did not have an opportunity for a shot. The eggs, which were well incubated in consequence of the lateness of the season, were difficult to prepare. I think the birds must have been delayed in their nesting. The set may even have been a second one for the season. The nesting birds at Prairie Point were so frequently disturbed by the Eskimos that it seems likely certain pairs may have been driven from their chosen nesting

ground and eventually built a delayed nest on the opposite side of the Inlet.

Two Blue Goose nests found in the Prairie Point region by the natives were not preserved. These nests both held four eggs. No downy young birds were collected.

Eggs: When first laid the egg of the Blue Goose is white, or, as Soper (Ibid., p. 53) says, "very pale creamy-white." The eggs brought in by Tommy Bruce had not been very thoroughly cleaned and were a little darker in appearance than those I found and prepared at South Bay. They are indistinguishable from eggs of the Lesser Snow Goose in color. The shell is firm and tough and it has a dull gloss which is more evident in heavily incubated than in fresh eggs.

Measurements in Millimeters of Blue Goose Eggs from Southampton Island.

Set No.	Egg No. 1	Egg No. 2	Egg No. 3	Egg No. 4
1	81.4 x 49	80.4 x 51.3	Runt	
2	85.4 x 52.7	80.4 x 50.2	83.2 x 54	
3	83.2 x 51.8	79.3 x 51.9	80.9 x 50.7	
4	73.5 x 49.2	77.2 x 50.9	78 x 50.8	79 x 51

From the above table it will be seen that the eggs do not vary greatly in size. The average of the twelve normal eggs which I brought back is 80.1 x 51.1, the largest specimen measuring 85.4 x 52.7, and smallest 73.5 x 49.2. The average size of the thirty-three eggs brought back from Baffin Island by Soper is 80.5 mm. x 51.1 mm. The largest egg in Soper's series measures 86.1 mm. x 53.4 mm. and the smallest 74.2 mm. x 50.2 mm.

Most of the nests found by Tommy Bruce at Cape Kendall contained three eggs. The nest I found at South Bay held four eggs. As noted before, however, larger sets have been seen by the Eskimos, and family groups with four and five young were noted at Cape Low. As regards the number of eggs in the set Soper says: "of the eleven sets of Blue Goose eggs collected, four consist of four eggs, three of three eggs, and four of two eggs each, making an average, therefore, of three eggs to the set."

Annual Program of the Blue Goose on Southampton Island: The Blue Goose returns from the south early in June, at the same

time as the Lesser Snow Goose. Some of the birds appear to be mated at the time of their arrival; others are in flocks, whether mated or not. At least some of the birds reach Southampton from the east or southeast, apparently by way of Coats Island. Others may come in from the west, or southwest, or even directly from the south.

Most of the birds make their way rapidly to the favorite nesting ground at Cape Kendall where, among the grass-lined lakes, nesting sites are promptly chosen. Nests are placed in the open, usually well separated, as described by Soper (Ibid., p. 54), on the driest ground available, and not often far from a lake. When the first egg is laid there is little down in the nest but as the set increases more down is added. The female incubates the eggs and the male usually stands on guard not far away. I have no definite data on the period of incubation or on the care of the young.

The enemies of the Blue Goose are the same as those of the other geese. Jaegers, Gulls, Ravens, and Arctic Foxes take a good many eggs and doubtless occasionally capture the young birds. The Snowy Owl and Weasel may occasionally capture young birds. The adult geese are so wary and so keen-eyed that they probably are caught only rarely by such predators as the foxes or wolves, and they are too heavy to be killed very often by Gyrfalcons or even Snowy Owls. The Eskimos take a great many eggs during some seasons and sometimes kill the adult birds with their rifles and shotguns. I was surprised to learn, however, that, probably due to the difficulty of reaching the nesting colony in mid-summer, the Eskimos almost never attempt to capture the birds during their flightless period.

During the summer the adults undergo a complete postnuptial moult. At this time, according to Amaulik Audlanat, they move inland, sometimes quite a distance, remaining together in family groups. As autumn approaches they come together in larger bands near the coast. They prepare to leave for the south in late August or early September. In leaving Southampton they frequently, perhaps customarily, fly to the south or southeast, apparently for Coats Island, where they may stop at a favorite feeding ground en route to James Bay where they are known to congregate in great numbers before passing on to the south. During their entire

summer existence they are closely associated with the Lesser Snow Goose. They arrive with that species in the spring and depart with it in the fall, sharing the same food, shunning the same enemies, and responding to the same stimuli of one sort or another in a remarkably similar manner.

THE LESSER SNOW GOOSE.

Eskimo Name: Both Aivilikmiut and Okomiut used the word *Khanguk* when referring to this species. The similarity of this name to that for the Blue Goose, *Khavik*, is marked. Obviously the first syllable of both words is an imitation of the cry of warning which is characteristic of both species, and this use of the same root with different qualifying suffixes suggests that the Eskimos themselves probably regard the two birds as closely related. Certain hunters even expressed a suspicion, that the *Khavik* might be a *Khanguk* only partly grown. All the natives appeared to be fully aware that the two species interbreed occasionally. One man told me that aged individuals of both the *Khanguk* and *Khavik* were white with black on their wings, but he could not, of course, offer any proof of his statement. There are, in the Eskimo language, many cases wherein strikingly similar words refer to strikingly dissimilar objects. To my way of thinking, however, the similarity of the words *Khanguk* and *Khavik* indicates that the Eskimos regard the two species as closely related, and with this belief Soper (Ibid., p. 38) evidently concurs. No Eskimo ever applied to either species, so far as I am aware, a term in any way reminiscent of the onomatopoeic *Wavy, Way-way*, or *Wewais* (George Barnston, 1862, cf. Bent, Life Histories of the American Water Fowl, 1925, p. 168) of the Indian tribes to the south; nor did they use a separate word for the gray-colored young of either the Lesser Snow or Blue Goose.

Status: The Lesser Snow Goose occurs as a summer resident all over the western half of Southampton Island. It is especially abundant at Cape Kendall and, irregularly so, at Cape Low. It does not nest far inland, so far as I have been able to learn. It is much commoner than the Blue Goose with which it frequently associates and occasionally interbreeds. I think it probable that all Lesser Snow Geese which come to Southampton during the

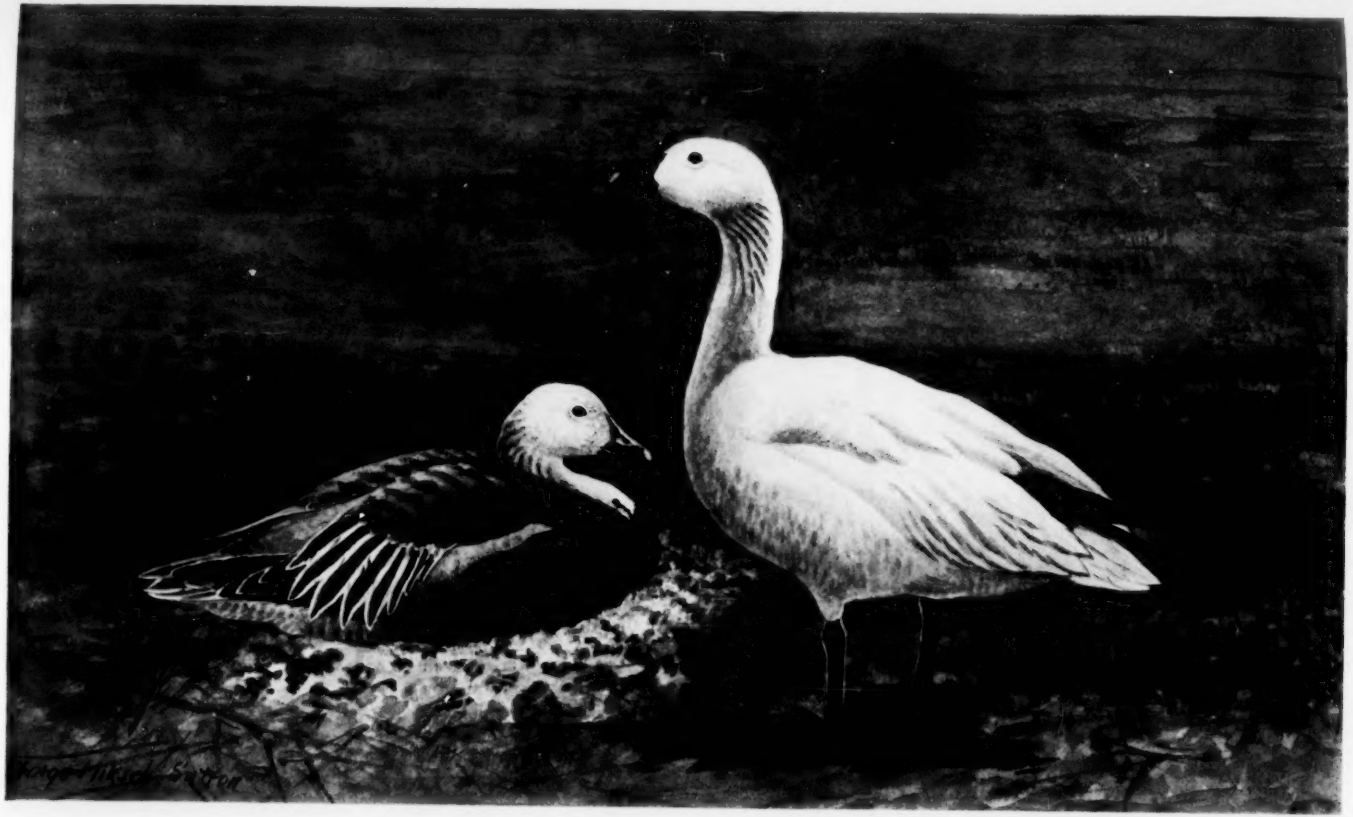
course of the spring nest there, and that those individuals which pass to the northward of the Island to breed probably do so either to the westward or the eastward of the Island.

Résumé of Fall Field Work: The Lesser Snow Goose was not seen about Coral Inlet, either near the Post or at Prairie Point, during the late summer or fall of 1929, though both Mr. Ford and his son had seen fair-sized flocks passing to the northward and the westward during the spring; several nests had been found at Prairie Point during June; and the Eskimos had brought in quantities of eggs from the Cape Kendall region during July.

At Cape Low, on September 2, however, we encountered tremendous flocks of the magnificent birds. The first were seen about 10 o'clock in the morning. I was crouching behind a low gravel ridge watching a pair of Red-throated Loons and their half-grown young. Suddenly I was aware of a moving shadow in the moss near me and of the rush of wings. Looking up I beheld four white geese swiftly flying toward a nearby lake. Their silken plumage somehow so caught and refracted the light rays as to present a rosy-orange color on their shadowed under sides. The flock made no vocal sound until I moved to see them the better; then they set up a loud, irregular, falsetto honking, circled around me once, and sped across the lake to join a distant flock which were feeding on the grass-lands and which, up to this time, I had not observed.

All that day and the next Lesser Snow and Blue Geese, in closely associated companies, were seen. Flocks of hundreds, perhaps thousands, swept along the lake shores, usually a mile or so inland from the salt water, now pausing to rest or to graze, now rushing upward with a mighty din to circle about aimlessly and to settle once more. I tried stalking the birds with my shot gun, but was unsuccessful. Even my rifle-armed companions could not get near enough for a shot. The country was exceedingly flat of course, and there were no trees, stones, or embankments behind which we could approach. The geese were feeding on grass which grew along the margins of the wide, shallow lakes. Here, among the innumerable tracks in the mud, were a few feathers, and droppings which were obviously fresh.

Their lines of flight were not, as a rule, V-shaped. Sometimes the birds flew abreast, or Indian file, the whole line shifting grace-



BLUE GOOSE (LEFT) MATED WITH LESSER SNOW GOOSE, DRAWN FROM DESCRIPTION OF JACK FORD AND THE AIVILIK ESKIMO, TOM BRUCE. [FROM PAINTING BY GEORGE MIKSCH SUTTON.]

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fully, now this way, now that, the vibrant pink of their shadowed underparts glowing against the gray sky. As the flocks flew up from their feeding or resting grounds they sometimes had the appearance of a terrific snow flurry, and the wild clamor of their voices added to the impression of reckless tumult. Among them were numerous dark-plumaged birds, many of them their own young, no doubt, others both adult and young Blue Geese. The number of white birds, however, was much in excess of the number of dark-colored individuals, indicating either that relatively few young had been successfully reared, or that, due to immaturity, many of the apparently full-grown birds had not bred. While these large flocks were feeding I noted no tendency for the family groups to keep together. After they had risen high in air, however, they arranged themselves in smaller companies, some as though in family groups. According to our observations and to the reports of the Eskimos, the adults and young always migrate southward together.

It struck me as peculiar that birds of such an isolated place should be so wild; the larger and usually very wary Whistling Swans were not nearly so restless, and most of the shore-birds were quite fearless. Much of the apparent wariness of the birds was due basically, I now believe, to a desire to be off for the south. The post-nuptial moult had apparently been completed, and all the young birds as well, as far as I could see, were flying perfectly. Perhaps the food supply for the gathering hordes was inadequate. At any rate, whatever the cause of their state of confusion, the birds seemed to derive some satisfaction merely from flying about and from cackling and yapping loudly. Their feeding and resting periods were short and sporadic. On September 3, at about noon, we saw most of the geese tower higher and higher and finally separate into neatly arranged companies of from four or five to thirty birds; heard them change their tone of voice in some indescribable way; and watched them actually leave the region, apparently for good.

We did not find any sign of a nesting colony at Cape Low. On the extensive feeding grounds all the feathers examined had, obviously, just been plucked or preened from the birds and the droppings were all fresh. We might, of course, have missed the

precise place which the natives had visited in previous years. We all came to the conclusion, however, that the geese had shifted their nesting grounds to the north, to the shore of the Bay of God's Mercy, where Shookalook and other natives had reported them as exceedingly abundant during the spring and summer.

Résumé of Spring Field Work: A flock of six Lesser Snow Geese of the 1930 spring season appeared on May 15 at the edge of the ice-floe south of Munnimunnek Point, along the western shore of South Bay. The natives who reported them believed them to be mated. On May 18, one was seen at Bear Island and shot at by the Eskimos encamped there. This bird had flown in from the open water in company with a Richardson's Goose. It spent most of its time standing and walking about in the snow. It did not peck at the snow as though in search of food.

On May 31, a large flock passed over Coral Inlet, apparently headed northeastward for a nesting ground near Itiujuak. On June 5, while I was walking through the deep, damp snow near the mouth of the Koodlootook River, two handsome birds (probably a pair) flew not far above me, calling in dignified but shrill voices. They were headed toward the west where there seemed to be extensive snowless areas along some of the higher gravel ridges. In these bare areas, however, I found no goose droppings or feathers. On June 6 and 8, a pair were seen flying toward the head of South Bay. On June 9, a flock of four and a solitary bird were noted at Prairie Point.

On June 10, huge flocks were seen at the Post, flying high, and headed westward. They had evidently come to Southampton from the south and east and not from the west. There is a possibility, of course, that there are colonies of white geese on Southampton about which the Eskimos have never learned, and these flocks may have been such a colony returning *en masse* to their summer home; but I think it probable that they were the Cape Kendall birds.

On June 12, additional flocks were seen flying westward over the Post, and a very fat female specimen, weighing 5 lb. 9 oz., with much enlarged ovaries, was shot at the mouth of the Koodlootook River by the native Keetlapik. I noted that the inner surface of the delicate skin of this bird was marked with exceedingly fine grayish lines, which presented almost the appearance of vermicula-

tions. I do not know what caused this peculiar coloration. The gizzard contained little aside from gravel.

On June 13, Jack Ford shot four specimens in the plains near Itiujuak. Two of these (sex undetermined) were fed to the dogs. The two brought home, a male and a female, were not weighed because their viscera had been removed. The ovaries of the female were exceedingly large. It is likely that she would have laid eggs in a few days. Jack noted great numbers of Lesser Snow Geese, Blue Geese, and Whistling Swans in this region. The birds were passing back and forth constantly, often not far above him and his Eskimo companion. It is highly regrettable that, due to the impossibility of transporting outfits over the snowless tundras and particularly across the swollen waters of the streams, we could not study this nesting ground a little later in the season. We did, however, make a two-day attempt to reach the region, but had to give up because the dogs could not haul our komatik through the gravel, mud, moss and lakes.

On and about June 15, Tommy Bruce observed and shot many Snow Geese along the north shore of the Bay of God's Mercy. Here he found hordes of *Khanguk* nesting between the wide, shallow lakes, intermingled with the *Khavik*. He was fairly bewildered by the abundance of birds. Their clamor was deafening. All about his camp they flew ceaselessly. He found *amishualueet* ('very many') nests nearly all of them with five or six eggs; and he, his family, and his large team of dogs lived for several days on geese and goose eggs. All the birds near his camp appeared to be mated, the males standing guard as the females incubated. Resting birds frequently stood on one foot or ran along waving their wings wildly, calling loudly to pairs or small flocks which were flying over. They fed on grass which they nibbled off or pulled up as they walked slowly along. Their note of alarm was a deep, hoarse "*kha-ah.*"

Tommy Bruce collected several birds and eggs for me, but could not bring them in because his komatik was overloaded. He found what he considered full sets of five and six eggs as early as June 13, the season being earlier as a rule in the Cape Kendall region than at Coral Inlet. He did not see more than eight eggs in a nest, nor fewer than four. The usual clutch was six. The nests were built

on the driest available ground, among the grass, between the lakes. Early in the season the nests contained but little down; later, however, as more eggs were laid, more down was added and eventually there was enough to cover the eggs completely when the parent bird was not incubating. Many newly moulted body feathers were found all about the colony; large quills which were noted and brought in for my examination, however, had obviously been moulted during a previous year. It would appear from these data that the midsummer moult may be in progress at the time the birds arrive in spring, though the losing of the remiges and rectrices does not take place until later in the season, probably well after the young have hatched.

Several more or less isolated nesting pairs were discovered in the South Bay region at about the time Tommy Bruce was living near the large colony at Cape Kendall. The first of these was found by Jack Ford at Itiuachuk, on June 18. The nest, which held four fresh eggs (possibly not a complete set) was placed near the end of a long, narrow point of land which projected from the shore of a large lake about four miles inland from the Bay. The land here was comparatively dry, the ground about the nest having little vegetation. The parent birds were very wary. When first seen, the male was on guard not far from the nest, and the female on her eggs. The nest contained very little down.

On June 19, I noted a pair flying toward the gravel plateau at Itiujuak where they probably had a nest. On June 20, at Prairie Point, I found a well-built nest containing four fresh eggs, situated on a narrow strip of gravelly land between a little pond and a large shallow lake. I had seen the guarding male from afar and approached cautiously. As I drew nearer, he walked slowly toward the shore of one of the lakes, giving me no clue as to the whereabouts of the nest. All at once, almost under foot, the incubating bird stood up, ran clumsily a short way and rose noisily into the air. Though pure white and scarcely sheltered at all by the grasses about her, she had escaped detection, partly because she had held her neck low, partly because the shadow of the grasses had broken up the whiteness of her back, and partly, perhaps chiefly, because the male had kept himself in evidence so constantly. After the female flew off the male quickly joined her. Immediately they

were beset by a clamorous mob of Herring Gulls. They circled once or twice, calling constantly, then alighted about half a mile away where they appeared to preen and graze. I waited nearby. The gulls promptly drifted down toward the nest. I shot at them to drive them away and, of course, frightened the geese. After taking photographs, I collected the eggs. The nest was not heavily lined with down. It was placed among the gravel between several thin clumps of grass, about forty feet from the edge of a pond, and two hundred yards from the shore of a much larger lake. When I last saw the parent birds they were standing side by side on the tundra, about a mile away.

On June 20, the Okomiut Eskimos at Cape Kendall gathered hundreds of eggs, eighty of which they brought to the Post on July 10. One set of six they had kept separate and these I was able to save. They reported the *Khanguk* as about twice as abundant as the *Khavik*. All the eggs they gathered were fresh.

As noted under the discussion of the Blue Goose, a nest of mixed parentage was collected at Prairie Point on June 25. Further discussion of this nest will be given later. On the same date the female of another, an unmixed pair of *Khanguk*, was shot at Prairie Point not far from the place where the mixed pair were found. The region of the belly in this specimen was virtually devoid of feathers and the skin was thick, wrinkled and flabby. The inside surface of the skin showed the same grayish lines previously mentioned. The bird weighed 5 lb. 2 oz. The gizzard was virtually empty.

On July 14, Father Thibert and some of the Eskimos saw several flocks of white geese (perhaps forty birds in each flock) flying eastward over the Post. It is not known where these birds were going, but they were flying high, and the flight had the general appearance of a migration rather than of a daily quest for food. Perhaps they were sub-adult, non-breeding birds; or they may have been pairs whose nests had been robbed repeatedly by Eskimos, Gulls or foxes, and which had therefore given up attempting to rear a brood during the brief remaining period of the summer.

Eggs: The eggs of the Lesser Snow Goose when first laid are white or pale creamy white, sometimes, according to my personal observation, with a very faint bluish tinge. After the eggs have been in the nest for a while they become darker as a result of stain and

exposure. They are indistinguishable from eggs of the Blue Goose in color. They are firm-shelled, and have a slight gloss.

Measurements in Millimeters of Lesser Snow Goose Eggs from Southampton Island.

Set No.	Egg No. 1	Egg No. 2	Egg No. 3
1	82.8 x 54.3	78.2 x 51.2	79.7 x 52.7
2	76.8 x 58.3	85. x 56.	83. x 56.4
3	82.8 x 52	81. x 52.1	81.6 x 51

Set No.	Egg No. 4	Egg No. 5	Egg No. 6
1	81.9 x 54.7	78.6 x 53.2	77.3 x 51.5
2	81. x 56.8		
3	80. x 52		

Nests found at Cape Kendall by Tommy Bruce contained from four to eight eggs, but as a rule held five or six, six being the number most commonly seen. The two nests found in the South Bay region both contained four eggs, and these sets may not have been complete. The average measurements of the fourteen eggs brought back are 80.7 x 53.7; the largest of these measures 85 x 56 and the smallest 77.3 x 51.5. Bent (Life Histories of North American Wild Fowl, 1925, p. 166) found the average measurement of 103 eggs to be 78.6 x 52.3. Reference to the description and measurements of the eggs of the Blue Goose will show that the eggs of the two species are practically indistinguishable.

Annual Program of the Lesser Snow Goose on Southampton Island: The Lesser Snow Goose returns from the south sometimes long before the snow and ice have completely melted from their favorite feeding- and nesting-grounds, usually during the first week of June. If they find the tundras covered with snow they swim about in the salt water at the floe or rest on the ice at the floe-edge. What they eat at this time I cannot say. They do not dive, so they may have to live upon such bits of seaweed as they find attached to the ice, or upon crustaceans which swim about near the surface of the water. The earliest arrivals are eager to come inland to the gravel ridges where they can nibble at lichens, dig up roots, and swallow the coarse gravel. At Coral Inlet they make their way inland by way of Bear Island where they rest and feed, waiting for the sun to melt the winter's drifts.

Many of the *Khanguk* are mated when they reach Southampton; others arrive in flocks and mating apparently goes on after the nesting grounds have been reached. All of the birds which I noted in the spring appeared to be pure white, and the Eskimos told me that they rarely saw a bird which appeared to be other than a full adult anywhere in the Cape Kendall region, save during late summer when the young were about. I did not witness any courtship antics. The Eskimos told me that the birds were very noisy during the mating season, however, and that they chased each other a good deal, both while on the ground and in the air. The pairs feed together early in the morning and in the evening in a favorite meadow, where they may wade out into the shallow water to preen and bathe.

The nest is situated on dry ground at the edge of a lake, sometimes at some distance from the water's edge, and often three or four miles inland from the salt water. There is little down in the nest at the time the first egg is laid, but by the time the set is complete the lining is thick and warm, and capable of covering all the eggs while the parent is away from the nest. From four to eight eggs are laid, but the set is usually six. Only the female incubates. The male stands on guard, usually not far from the nest. The two birds are devoted to each other, and stay together all the time, during the period of incubation, while the young are attaining full size, at the start of the southward migration, and, perhaps, even during the winter. It is my belief that these birds frequently mate for life; but I think that if one mate is killed another is taken during the winter or in the following spring.

Unfortunately, I cannot offer much information as to the midsummer activities of the birds since I did not see the downy young or the adults during the period of the post-nuptial moult. The Eskimos told me that the old birds sometimes led their young inland a way while they were gaining their flight plumage. In the fall the family groups gather in large flocks at favorite feeding places and make ready for their southward migration. They leave during the first week in September. It is possible that they occasionally fly westward or southward in leaving the Island but large flocks are known to visit Coats Island to the south and east, and they were seen leaving in this direction during the fall of 1929.

The natural enemies of the adult *Khanguk* are few. The Eskimos do not often kill them for food unless the geese happen to be very abundant. The eggs, however, are gathered eagerly by the natives, and nests are often destroyed by Gulls, Jaegers, Foxes, and Ravens, especially if, for some reason or other, the eggs are left uncovered while the parent birds are away. So far as I could learn the Eskimos never organize mid-summer drives for capturing the adults and young during the period when they cannot fly. Young birds doubtless have many enemies, however, chief among them, perhaps, the Arctic Fox.

HYBRIDISM.

At the Cape Kendall colony among the thousand nesting pairs of Lesser Snow and Blue Geese there were, according to Tommy Bruce's estimates, about twenty pairs where one bird was distinctly white and the other distinctly 'blue.' As to those pairs wherein a Blue Goose with white belly or white blotching (see color-plate) was mated with a full-blooded Blue, Tommy Bruce was not so definite. He told me that he had seen a good many "spotted" birds among the Blue Geese, and that in a good many mated pairs both birds were "spotted" and blotched considerably. He did not, however, see anywhere such an example as I would call a *spotted* white Goose,—that is, a white bird marked with adventitious spottings or blotchings of dark gray. One of the eight birds which Tommy Bruce collected and brought back was a white-bellied Blue Goose, the female of a mated pair.

The other two cases of what we may at present call definite hybridism were observed at Prairie Point, on June 25, and at the head of South Bay on July 12, 13, and 14. In the first of these cases, the male bird (the bird which stood on guard at the nest) was apparently a full-blooded Lesser Snow Goose, and the female (the bird which was seen incubating the eggs) a full-blooded Blue. Jack Ford, who discovered this pair did not observe any noticeable white on the belly of the female. The lining of the nest, however, obviously contained a good many *white* feathers, since the portion of the nest which was brought in with the set contained *only* white feathers and down as far as I could see. The nest contained six eggs which were almost fresh. The measurements in millimeters of these eggs are as follows: 84 x 55.5; 79 x 54.5; 83 x 55.5; 83.5 x 55;

81.5 x 55.5; 81.5 x 54.5, the average being 82.1 x 55.1. This case is interesting in that though the female was apparently a pure Blue Goose, the size of the set of eggs was that of the Lesser Snow. That such association for a season or even a life-time between birds of distinctly different strains could be responsible for changing the size of the set laid by the female seems scarcely possible. More likely the female parent, though apparently a pure-blooded Blue Goose, was in reality a hybrid wherein the Lesser Snow Goose strain asserted itself in the size of the egg complement rather than in color.

In the second case, which may or may not represent a case of hybridism, two birds were seen flying about together in a region admirably suited to the birds' nesting requirements; but frankly, I am not even certain that the birds were of different sexes. They acted as though they had been together for a long time, but I did not actually find the nest, nor can I be sure they were mated. One bird was a normal Lesser Snow, the other a rather 'blotchy' Blue Goose.

The female of the nesting pair of Blue Geese which I found at the head of South Bay, and whose nest and four eggs I collected on July 14, was rather a 'blotched' bird also, the belly being white and the dark chest and sides marked with spots and mottlings of white. The nest contained some white feathers and some obviously dark of the normal color for a full-blooded Blue Goose.

Almost every thorough account which has been written of the Blue Goose has included some reference to these white-bellied birds.[1] At the famous feeding grounds of the species at the southern end of James Bay I personally saw many Blue Geese which were so much blotched as to merit the term 'piebald.' A more detailed account of these birds will appear in one of Mr. W. E. Clyde Todd's forthcoming reports. In some accounts the birds with white underparts have been called the "white-bellied phase." All these birds with excess white in their plumage, I now believe to be hybrids. They do not, as I see it, merely represent extremes in a species which tends toward variableness in coloration. After all, among

[1] The Blue Goose photographs reproduced in Bent's Life Histories of North American Wild Fowl, Bulletin 130 of the United States National Museum, show many of these spotted birds. In Major Allan Brooks' drawing illustrating Mr. Soper's report, a white-bellied bird is shown.

such species as the Blue and Lesser Snow Goose, where hybridism is known to occur, it is only logical to expect some noticeable external evidence of this hybridism in the progeny.

In all this discussion of hybridism I have, of course, assumed some points. Since I have never collected and personally examined what I am calling a 'mixed pair,' I am assuming that the white birds are pure-blooded Lesser Snow Geese rather than albinistic Blue Geese. This assumption may not be precisely warranted. We think of the albino among the familiar dooryard birds of the eastern United States as an individual which is considerably handicapped by a coloration not properly protective and which will, therefore, be so promptly eliminated from the picture that its unorthodox characters will have no opportunity to be perpetuated for any great length of time. In the Arctic, on the other hand, in a region where a pure white bird such as the Lesser Snow Goose has maintained itself successfully as a species for a long time, a pure albino individual of the structurally similar Blue Goose may encounter no out of the ordinary problems whatever, and may, therefore, succeed in living the full span of its existence and in perpetuating its type of coloration for some time. In view of the fact that all white birds in the crossed pairs were thought to have black primaries, however, it seems safe to assume that these birds were not albino Blue Geese, but pure-blooded Lesser Snows.

It is regrettable, of course, that we have so little definite knowledge of the effects of the crossing of the two strains. No one knows precisely what the individuals of the first generation look like, or what sort of progeny the crossing of a hybrid with a pure-blood of either strain would produce. We only know that among the resident Blue Geese of the Island there are a great many individuals which are variously blotched with white, and that there appear to be no Snow Geese which are blotched with "blue."

According to the experience which breeders have had with poultry, there might be an almost endless variation in a series of Lesser Snow × Blue Geese. The hybrids which we have observed, however, do not vary greatly. As has been stated before, there are no "blue-spotted" Lesser Snows. Personally I have never seen a bird which I should call "half-Snow" or "half-Blue." The hybrids apparently are *always* white-blotched Blue Geese.

The appearance of these hybrids, generally speaking, leads us to believe that the present problem is not one of simple Mendelian inheritance. It is easy to believe that the color-characters which play a part in the situation are exceedingly complex. Even in the pure-blooded Lesser Snow Goose whose color-pattern is very simple to all outward appearances, the interaction of the color characters which are responsible for this color-pattern may be highly involved.

The tendency for the hybrid progeny to resemble the Blue Goose rather than the Lesser Snow Goose parent must be traceable, somehow, to a dominance of the Blue Goose characters which govern the pattern of the back, wings, chest and tail. The fact that white patching and blotching occurs on the chest and rump, and extensively on the belly and sides, however, shows that the genes of the Lesser Snow Goose which regulate the coloration of these areas must be at least partially dominant over the Blue Goose genes.

The fact that the young of both the Lesser Snow and the Blue Goose are similarly dark-colored may have a bearing upon the matter. Since the young of both species are dark-colored, we may assume that the ancestral form was dark-colored also, probably considerably more like the adult Blue Goose than the adult Lesser Snow. This coloration of the ancestral form may to some extent account for the dominance of the color characters of the darker bird over those of the white-colored one.

SUMMARY AND CONCLUSIONS.

The Lesser Snow and Blue Geese, as observed on Southampton Island, are remarkably similar in many ways. Individuals of the two species which nest on the Island probably spend their entire lives together, not only in their summer range, but also during the period of migration and on the wintering grounds along the coast of the Gulf of Mexico. Their general behavior on the Island is very similar. They live on the same food, express themselves through similar call-notes, bodily attitudes and mannerisms, shun the same natural enemies, nest in the same sort of place and in the same way, and respond to the various elements of their environment in an amazingly similar manner. Their facial expression and

the colors of their fleshy parts are, so far as I have observed them, identical. Even in size and weight they appear to be counterparts. Some of this similarity may be traceable to an imitation of one species by the other, some of it to fundamental sameness in bodily structure indicative of common ancestry, and some of it to actual interbreeding of the two forms. For some time prior to my Southampton experience I entertained the belief that the two species might actually be one and the same. This belief was due chiefly to field experience in the James Bay region with birds which had such blotchy and mottled appearance as to suggest that they were a transition stage between a dark-colored, supposedly immature, 'blue' goose, and a fully adult white bird.

I now believe that the two species are distinct, though they are certainly closely related. My reasons for regarding them as distinct species are, briefly, as follows:

First: There is a well-defined breeding colony of Blue Geese on Baffin Island where very few Lesser Snow Geese are found. Second: According to Bent, Taverner, and others the recognized range of the Lesser Snow Goose includes much territory where the Blue Goose does not occur. Third: The number of eggs in sets of the two species is different, that of the Blue Goose ranging from one to five, that of the Lesser Snow from four to eight or nine. Fourth: The color of the downy young according to Soper (Ibid., p. 15) is distinctly different in the two species, as is also the color of the juvenal in its first flight plumage.

Soper did not find any evidence of hybridism between species on Baffin Island. On Southampton, however, the species are definitely known to hybridize to a limited extent. In the Cape Kendall region it is estimated that among 1000 pairs of breeding Lesser Snow and Blue Geese there were twenty pairs which represented a definite crossing of the species. There were also many birds with white belly or blotchy appearance which were probably of mixed blood. At Prairie Point, a locality 150 miles east of the Cape Kendall colony a mixed pair was found with a set of eggs similar in number to sets of the Lesser Snow rather than the Blue Goose. In the same general region (South Bay) another two birds, one a Lesser Snow, the other a Blue, were noted on several dates and thought to be nesting, and a set of four eggs was taken from

a nesting pair of Blue Geese, the female of which was a white-bellied bird. In the Prairie Point-South Bay region I think there were not more than twenty pairs of Lesser Snow and Blue Geese altogether, so the proportion of hybridism was apparently far greater here than at the centre of abundance of the two species at Cape Kendall.

At the present time it seems to me that the occurrence of all these white-bellied and blotched birds may most easily be accounted for through hybridism. It is possible that some of it may be partial albinism, and some of it individual variation in a species whose coloration tends to be inconstant and variable, but the fact that the two species do cross and that this crossing must produce progeny which resembles neither parent strictly and both to a certain extent, does account for the "piebald" birds in an easy manner.

Hybridism is known to occur among ducks and geese the world over, even between species which are thought to be only distantly related. Lesser Snow and Blue Geese have been known to mate in captivity. It is my belief that such hybridism as occurs between the Blue Goose and Lesser Snow Goose on Southampton results from the proximity and similarity of the two species, combined, first, with overabundance of one sex or the other in either species, and second, with the strong tendency toward monogamy which is known to be characteristic of geese in general. Were the birds polygamous or polyandrous, unmated birds could find an outlet for their amatory impulses without recourse to hybridism. The birds appear, on the other hand, to form strong individual attachments, and this results in the cross-mating of such lonely or stranded individuals as cannot find mates of their own species.

Strictly speaking, neither the Blue Goose nor the Lesser Snow Goose of Southampton Island can be considered today an *absolutely* pure-blooded species. So frequently do white-bellied and blotchy Blue Geese occur that one hesitates to attempt a description of a 'typical' Blue Goose. To call the Blue Goose merely a variable species somehow does not settle the matter. Whether the two species were once one and the same or whether, in time, they will merge, is an interesting problem to speculate upon. The two birds are structurally so similar, and in habit and expression of person-

ality so nearly identical that we can but marvel that they have succeeded as well as they have in retaining such characters as are usually accepted as diagnostic.

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A FIFTY-YEAR COMPARISON.

BY BAYARD H. CHRISTY.

SANDUSKY BAY opens from the southernmost corner of Lake Erie and extends westward about twenty miles. It is quite shallow, its shores are low and level, and between land and water extends a broad border of marsh. Streams enter the head of the bay through long finger-like approaches. The property of the Winous Point Shooting Club lies across the northernmost of these fingers—that fed by Mud Creek—and includes the marshlands of the opposite shores. The open water is about a mile wide, and the extent of the marshes on either side is not less, so that from land to land the distance is about three miles. The club property extends a mile or more up and down the bay.

The predominant marsh plant is the cat-tail. It stands in densest ranks and spreads over acres upon acres. The margins of the cat-tail marsh are deeply indented; ponds open within its extent; and channels wind through. These open spaces are more or less grown up with minor forms of plant life: the bur-reed, the deer's tongue, the bulrush; lotus, pond-lily, and pickerel-weed. Subaqueous plants choke the shallows. They lift delicate yellow blossoms in air, and their bleached masses, humped above the surface, give from a distance a semblance to sand-bars.

The continuity of the marsh is interrupted by islands grown with forest trees. Winous Point itself is such an island; it is joined to the mainland by an artificial causeway. In these islands stand elms, oaks, hickories, poplars, willows, and trees of other sorts; and, where opportunity affords, bushes and vines and annual plants, in such luxuriance as to form all but impenetrable covers. At the end of June the shadowy borders of the woods are lit with masses of clustering, wide-petaled roses; the charm and effect are heightened by the range of hue, from carmine buds to pale broad blossoms. Beyond the marsh, the dry land, elevated but a few feet above lake level, extends away in an apparently limitless plain. It is wholly devoted to agriculture, with interspersed small areas of woodland.

The ever-moving cat-tails, the distant shadowy woods, the

silvery glimpses of open water, and the wide sky, are the elements of an unusual and beautiful landscape.

Besides the birds, the forms of animal life chiefly in evidence are the muskrats, which cut wide swaths in the cat-tails, and the carp (introduced in 1883), which in their spawning wallow in the shallows and start with sudden splash when disturbed. In this their season mosquitoes and other nuisances abound.

A half-century ago, during the week which ended July 4, 1880, two young men from Cincinnati visited Winous Point and made a list of the birds which they observed. They were Frank W. Langdon, who has since become a widely known physician and consultant in nervous and mental disorders, and J. Bonsall Porter, a son of a member of the club. Dr. Langdon compiled the list with annotations, and published it, under the title "Summer Birds of a Northern Ohio Marsh," in The Journal of the Cincinnati Society of Natural History, in the issue of October, 1880 (III, 220–232). In preparing the list, Dr. Langdon added to it other species which his companion reported to him as species observed on earlier summer visits.

Mr. John B. Semple of Sewickley, Pennsylvania, a present member of the club, and the writer, as his guest, were interested to go over the ground again, on the fiftieth anniversary of the visit of Messrs. Langdon and Porter, to make another list, and to check it against and to compare it with theirs. They, accordingly, visited Winous Point, and between the evening of June 30 and the morning of July 3, 1930, made their observations. The results appear in the following list. Dr. Langdon's arrangement and nomenclature have been revised; in a very few instances doubts respecting his identifications have been noted.

The observers of 1880 manifestly were much engaged in nest-hunting and egg-collecting; the observers of 1930, with less time at their disposal, made no such effort. The first statement under each species is Dr. Langdon's while following the date "1930" is that of the later observers.

SPECIES OBSERVED BY DR. LANGDON.

Colymbus auritus. HORNED GREBE.

1880. [Listed on the strength of a conjecture.]

1930. Not found.

Podilymbus podiceps. PIED-BILLED GREBE.

1880. [Six nests containing eggs (of the second brood) observed.]

1930. Frequently seen, accompanied by well-grown young.

Ardea herodias. GREAT BLUE HERON.

1880. Very common, and as shy as usual.

1930. Very common.

Botaurus lentiginosus. AMERICAN BITTERN.

1880. A few specimens only observed. Breeds (*Porter*).

1930. Observed frequently.

Ixobrychus exilis. LEAST BITTERN.

1880. Quite common. . . . [Eggs taken].

1930. Quite common.

Nyroca affinis. LESSER SCAUP.

1880. Small flocks observed daily during our stay. One individual, in a helpless condition, floated up to the dock, and was brought ashore by a retriever very gently, but died in a few hours.

1930. Not found.

Mergus merganser americanus. MERGANSER.

1880. One specimen observed, evidently disabled, though still capable of distancing a sail-boat.

1930. Not found.

Haliaeetus leucocephalus. BALD EAGLE.

1880. Several specimens observed during our stay, flapping lazily over the marsh or taking a siesta on some projecting snag. [A nest described.]

1930. Very common. To be seen at all hours. Birds both in adult and immature plumage. Knowing the existence of a nest in one of the "elm islands," we did not take time to look it up.

Falco sparverius. SPARROW HAWK.

1880. [No comment.]

1930. Not found.

Colinus virginianus. BOB-WHITE.

1880. [No comment.]

1930. Frequently heard whistling on grassy uplands adjacent to the marsh.

Rallus elegans. KING RAIL.

1880. One specimen taken by Mr. Porter, July 3d.

1930. Not found.

Gallinula chloropus cachinnans. FLORIDA GALLINULE.

1880. A very common species, breeding abundantly in the more open portions of the marsh. [Eggs taken and young observed.]

1930. Very common; the most abundant aquatic bird. Empty nests found and half-grown young frequently seen.

Fulica americana. COOT.

1880. A few only observed . . . A nest containing two fresh eggs. . . .

1930. Abundant. Well grown young frequently seen in company with parents.

Philohela minor. WOODCOCK.

1880. [No comment.]

1930. One flushed. The steward of the club, Leonard Jones, reported a nest this spring in woods near the club-house. He observed the sitting bird. The nest was afterward destroyed by high water.

Actitis macularia. SPOTTED SANDPIPER.

1880. Common.

1930. Common.

Sterna hirundo. COMMON TERN.

1880. Four specimens taken and others observed by Mr. Porter. We were informed that the "larger" Terns (probably this species) are quite plentiful in the marsh during rough weather, which drives them in from the lake.

1930. Noted twice or three times, singly or in pairs, flying over bay or marsh; and, on another occasion, in late afternoon, a compact company of 30-40, flying rather high, up the bay and up the wind, toward an approaching shower. Swallows in the air with them.

Chlidonias nigra surinamensis. BLACK TERN.

1880. A very common summer resident in the marsh; nesting. . . In no instance did we succeed in flushing a bird from the eggs, although they would appear in pairs to the numbers of twenty or thirty and hover about within a few feet of our heads making a great outcry when we approached their property. . At other times the birds were not at all gregarious, being usually observed foraging singly or in pairs. . .

1930. Common. Possibly less abundant than Dr. Langdon's comment would suggest.

Zenaidura macroura carolinensis. MOURNING DOVE.

1880. Nest containing half-fledged young observed July 2d.

1930. Very common. Many young flown from nests.

Otus asio naevius. SCREECH OWL.

1880. Two specimens, young of the year, taken; both were in the gray "phase" of plumage.

1930. One seen, in red phase.

Chaetura pelagica. CHIMNEY SWIFT.

1880. [No comment.]

1930. Abundant.

Megaceryle alcyon. BELTED KINGFISHER.

1880. Common.

1930. Common.

Colaptes auratus luteus. NORTHERN FLICKER.

1880. [No comment.]

1930. Common.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.

1880. Common.

1930. Common.

Dryobates pubescens medianus. DOWNY WOODPECKER.

1880. [No comment.]

1930. Common in woods adjacent to the marsh.

Tyrannus tyrannus. KINGBIRD.

1880. In the woods and groves bordering the marsh we met with this species in greater numbers than I have ever seen it elsewhere; they were not in flocks, but in some places almost every tree appeared to be occupied by a pair of these vociferous insect-collectors. The abundance of the "deer fly" and other insect pests about the marsh at this season is such that the Kingbird is an exceedingly welcome addition to the fauna.

1930. Abundant. Dr. Langdon's words, if applied to the present status, are not inappropriate; perhaps "almost every tree" would be thought hyperbole; but Dr. Langdon suggests as much.

Sayornis phoebe. PHOEBE.

1880. In spite of the abundance of insect food we observed but a few of this species.

1930. One noted.

Empidonax minimus. LEAST FLYCATCHER.

1880. One specimen taken.

1930. Not found.

Myiochanes virens. WOOD PEWEE.

1880. Common.

1930. Common.

Iridoprocne bicolor. TREE SWALLOW.

1880. An abundant species; the prevailing Swallow of the locality. Numerous young of the first brood observed on the wing in their peculiar silvery drab first plumage. On June 29th, a nest containing one addled egg and a young bird (probably of the second brood), was observed. . . .

1930. Present, but not abundant.

Riparia riparia. BANK SWALLOW.[1]

1880. A few only observed.

1930. Not found.

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[1] Query: Could Dr. Langdon have mistaken the Rough-winged Swallow which he does not mention but which we found to be common, for this species?

Hirundo erythrogaster. BARN SWALLOW.

1880. Much less common than the [Tree Swallow]. First brood on the wing.

1930. Abundant; the most abundant swallow.

Petrochelidon albifrons. CLIFF SWALLOW.

1880. Many observed carrying mud; doubtless to repair their nests for the reception of the second brood.

1930. Not found. A neighboring farmer, in reply to a question, said that the swallows used to nest under the eaves of his barn; that the sparrows drove them away, and for a time there were few or none; and that now, nesting within the barn, they had increased in numbers. The farmer's confusion of two species needs but a word: the birds of the earlier years were Cliff Swallows; those of the later years, Barn Swallows.

Progne subis. PURPLE MARTIN.

1880. [No comment.]

1930. Frequently seen in air; colonies in neighboring towns.

Corvus brachyrhynchos. CROW.

1880. [No comment.]

1930. Common; less abundant, however, than might be expected.

Sitta carolinensis. WHITE-BREASTED NUTHATCH.

1880. [No comment.]

1930. Not found.

Telmatodytes palustris. LONG-BILLED MARSH WREN.

1880. An abundant species, its lively, grasshopper-like notes resounding on all sides in the marsh. . . Five eggs appear to constitute a full set, although we took sets of four that were slightly incubated; and while most of those taken were fresh, or nearly so, a few sets were far advanced in incubation. (July 2d.)

1930. Would accept Dr. Langdon's statement of abundance.

Dumetella carolinensis. CATBIRD.

1880. [No comment.]

1930. Common; present in suitable localities.

Toxostoma rufum. BROWN THRASHER.

1880. Rather common.

1930. Not found.

Turdus migratorius. ROBIN.

1880. Common.

1930. Common.

Hylocichla mustelina. WOOD THRUSH.

1880. A few observed in the groves bordering the marsh.

1930. Not found.

Sialis sialis. BLUEBIRD.

1880. [No comment.]

1930. Rare. Noted at Port Clinton.

Polioptila caerulea. BLUE-GRAY GNATCATCHER.

1880. Evidently this species is here much less common than in southern Ohio, as our only identification of it rests on the note of a single individual heard.

1930. Not found.

Lanius ludovicianus migrans.[1] MIGRANT SHRIKE.

1880. A single pair observed.

1930. A single bird seen by the highway near Sandusky.

Vireosylva olivacea. RED-EYED VIREO.

1880. Much less numerous than in southwestern Ohio, being evidently replaced to a great extent by the Warbling Vireo which was exceedingly common.

1930. Would accept Dr. Langdon's statement.

Vireosylva gilva. WARBLING VIREO.

1880. As above stated this species was found in considerable numbers, the woods and scattered groves on the borders of the marsh resounding with their musical and somewhat plaintive notes.

1930. Would accept Dr. Langdon's statement.

Dendroica aestiva. YELLOW WARBLER.

1880. A very common species in the willows bordering the marsh; young of the first brood observed on the wing.

1930. Would accept Dr. Langdon's statement.

Seiurus noveboracensis. NORTHERN WATER-THRUSH.

1880. One specimen only observed; so close that there could be no question as to its identity.

1930. Not found.

Geothlypis trichas. MARYLAND YELLOWTHROAT.

1880. Rather common, though not so abundant as would be expected considering the adaptation of the locality to its habits.

1930. Abundant.

Dolichonyx oryzivorus. BOBOLINK.

1880. A few specimens only observed.

1930. Common in fields at northern base of Winous Point.

Sturnella magna. MEADOWLARK.

1880. Common.

1930. Common.

Agelaius phoeniceus. RED-WINGED BLACKBIRD.

1880. As would be expected the Red-wings were abundant in the marsh, rising before us at every few yards from their nests. . . At the time of our visit the young of the first brood were on the

[1] Dr. Langdon, following Coues, identifies the shrike of the region as the White-rumped Shrike, *Lanius ludovicianus excubitorides* (see, in this connection, his note in the 'Nuttall Bulletin' for April, 1879, 120). The subspecies of the Loggerhead and their ranges were subsequently (1898) worked out by Wm. Palmer (*Auk*, XV, 244), and the birds of the northeastern United States were segregated as a distinct subspecies and named *L. l. migrans.*

wing, and the second set of eggs had evidently not yet been completed in most cases, as most of the nests observed contained but two or three eggs, which were quite fresh.

1930. Very abundant. Dr. Langdon's notes apply to present conditions.

Icterus spurius. ORCHARD ORIOLE.

1880. Common.

1930. One pair noted, nesting near the club-house; a second pair along the highway, two miles away. Manifestly not a common species.

Icterus galbula. BALTIMORE ORIOLE.

1880. Common.

1930. Not common. A family party noted; the young able to fly. Possibly, since now the birds are all but silent, they are more plentiful than would seem.

Quiscalus quiscula aeneus. BRONZED GRACKLE.

1880. [Several shot for identification.]

1930. Very common.

Molothrus ater. COWBIRD.

1880. Common.

1930. Common.

Richmondena cardinalis cardinalis. CARDINAL.

1880. Not common; only two or three individuals observed.

1930. Fairly common and well distributed in thickets adjacent to the marsh.

Passerina cyanea. INDIGO BUNTING.

1880. Very common.

1930. Certainly present and well distributed. I should be disposed to drop the *very* from Dr. Langdon's comment.

Spiza americana. DICKCISSEL.

1880. Three or four specimens observed and taken.

1930. Not found on this visit. Three years ago (1927) a colony was found in a clover field, within a mile to the northward from Winous Point. This year (1930) the clover crop was poor and the fields few. A hasty survey of fields of clover and of alfalfa passed on the way from Winous Point to Port Clinton failed to disclose the bird.

Passer domesticus. EUROPEAN HOUSE SPARROW.

1880. Common at Port Clinton, within five or six miles of the marsh.

1930. Abundant about the club buildings and on adjacent farms.

Astragalinus tristis. GOLDFINCH.

1880. [No comment.]

1930. Common.

Pooecetes gramineus. VESPER SPARROW.

1880. [No comment.]

1930. Noted on farms north of Winous Point, along the highway.

Spizella passerina. CHIPPING SPARROW.
1880. Common.
1930. Not found.

Melospiza melodia. SONG SPARROW.
1880. Common.
1930. Common.

SPECIES LISTED BY LANGDON, *fide* J. B. PORTER

Gavia immer. LOON.
1880. Three or four specimens observed in summer.
1930. Not found.

Pelecanus erythrorhynchos. WHITE PELICAN.
1880. One or two instances of the occurrence of this species in summer are noted.
1930. Not found.

Phalacrocorax auritus. DOUBLE-CRESTED CORMORANT.
1880. Two specimens, male and female, taken in June, 1878.
1930. Not found.

Casmerodius albus egretta. AMERICAN EGRET.
1880. Usually common in August and September.
1930. Mr. Semple in the late summer of 1929 observed a flock of twelve, which roosted in woods near the club-house.

Butorides virescens. GREEN HERON.
1880. Breeds.
1930. Common; nest found.

Branta canadensis. CANADA GOOSE.
1880. Mr. Porter informs me that individuals of this species are frequently seen in the marsh in summer, having probably been crippled during the shooting season and thereby prevented from migrating.
1930. Not found.

Anas platyrhynchos. MALLARD.
1880. Breeds.
1930. Generally recognized to be a nesting species. The steward, well acquainted with the waterfowl, reported an individual feeding with his live decoys at the edge of the marsh.

Querquedula discors. BLUE-WINGED TEAL.
1880. Breeds; eggs taken in June.
1930. Notation regarding the presence of the Mallard applies to this species as well. We saw none, and surmised that already the birds might have lost their flight feathers and might be in hiding.

Nyroca americana. REDHEAD.
1880. One specimen, a male, taken June 28, 1879.
1930. Not found.

Nyroca valisneria. CANVASBACK.
1880. Of occasional occurrence in summer.
1930. Not found.

Charitonetta albeola. BUFFLEHEAD.
1880. Frequently seen and taken in summer.
1930. Not found.

Mergus serrator. RED-BREASTED MERGANSER.
1880. Identified in summer.
1930. Not found.

Cathartes aura septentrionalis. TURKEY VULTURE.
1880. [No comment.]
1930. Not found.

Accipiter velox. SHARP-SHINNED HAWK.
1880. May, 1877.
1930. Not found.

Accipiter cooperi. COOPER'S HAWK.
1880. May, 1877.
1930. Not found.

Buteo borealis. RED-TAILED HAWK.
1880. [No comment.]
1930. Not found.

Bonasa umbellus. RUFFED GROUSE.
1880. Rare.
1930. Not found.

Meleagris gallopavo. WILD TURKEY.
1880. Rare.
1930. Not found.

Porzana carolina. SORA RAIL.
1880. [No comment.]
1930. Identified once by its high, double-noted call.

Oxyechus vociferus. KILLDEER.
1880. Breeds.
1930. Several noted, among them birds of the year.

Capella delicata. WILSON'S SNIPE.
1880. Several shot in July, 1878.
1930. Not found.

Tringa solitaria. SOLITARY SANDPIPER.
1880. July, 1879-80.
1930. Not found.

Totanus melanoleucus. GREATER YELLOW-LEGS.
1880. July, 1879.
1930. Not found.

Totanus flavipes. LESSER YELLOW-LEGS.
1880. [No comment.]
1930. A party of four jumped in the marsh, and by whistling called back, within range of easy identification.

Pisobia minutilla. LEAST SANDPIPER.

1880. [No comment.]

1930. Not found.

Coccyzus americanus. YELLOW-BILLED CUCKOO.

1880. [No comment.]

1930. Pair noted, calling constantly about borders of wood adjacent to the club-house.

Myiarchus crinitus boreus. CRESTED FLYCATCHER.

1880. [No comment.]

1930. A pair, repeatedly noted in coming and going through woods on Winous Point, gave the impression, perhaps subject to correction, that the species is a common one.

Penthestes carolinensis. CAROLINA CHICKADEE. [? The region is within the range of **atricapillus**.]

1880. [No comment.]

1930. Not found.

Troglodytes aedon. HOUSE WREN.

1880. Breeds.

1930. Abundant in all suitable localities.

Bombycilla cedrorum. CEDAR WAXWING.

1880. Observed breeding in 1878.

1930. Two pairs noted in different places.

Pipilo erythrophthalmus. TOWHEE.

1880. [No comment.]

1930. Not found.

Spizella pusilla. FIELD SPARROW.

1880. Summer resident.

1930. A few noted on a farm adjacent to the south marsh.

SPECIES OBSERVED IN 1930, NOT LISTED BY LANGDON.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.

Frequently seen, even in daytime, though usually about sunset.

Anas rubripes tristis. BLACK DUCK.

Jumped, usually in pairs. In the course of two days we saw three or four pairs. The young, inferentially not yet able to fly, escaped observation.

Aix sponsa. WOOD DUCK.

The duck most abundantly seen in the marsh. We surprised several family parties in sheltered bays amid the cat-tails. In one case the young, unable to fly, scurried away through the stalks.

Phasianus colchicus torquatus. RING-NECKED PHEASANT.

Common at edges of woods bordering the swamp.

Rallus virginianus. VIRGINIA RAIL.

One seen. A note believed to be theirs frequently heard. Generally regarded as common.

Bartramia longicauda. UPLAND PLOVER.
One seen in a stubble-field near the highway, a mile to the north of Winous Point.

Empidonax virescens. ACADIAN FLYCATCHER.
In woods at Winous Point, where the trees stood in water.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.
Common.

Prothonotaria citrea. PROTHONOTARY WARBLER.
A pair in damp woods at edge of the marsh near the club-house. One of the birds carried food in its bill, inferentially for its young.

Icteria virens. YELLOW-BREASTED CHAT.
A pair in open, bush-grown, and dry woods near the club-house.

Setophaga ruticilla. REDSTART.
One pair, in woods adjacent to the south marsh.

Sturnus vulgaris. STARLING.
Abundant. Already gathered in flocks.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.
Common in boggy pasture lands between Winous Point and the highway.

SUMMARY.

Total number of species named, 108. The list of 1880 includes 63 species actually observed; that of 1930, 69. Fifty species are common to the two lists.

In addition, and on the authority of Mr. Porter, Mr. Langdon included 32 species more. Of these, the observers of 1930 noted 9, and 3 others are recognized to be of regular occurrence. Twenty species remain, accredited by hearsay, and manifestly most of them are in any case stray birds—Loon, Cormorant, Pelican, Red-breasted Merganser, Butterball, Canvasback, Redhead,[1] Goose, Least Sandpiper, Greater Yellow-legs, Solitary Sandpiper, Turkey Vulture. Of the other eight it remains to note that the Snipe is doubtless regular but rare as a nesting species; the Wild Turkey was, even in 1880, a fabulous bird; the Ruffed Grouse is probably to be found only in extensive and remote forests; the three hawks,

[1] Elsewhere in this paper the permanence of environment is dwelt upon. In one particular there has been change. In 1883 the German carp was introduced, and immediately it became overwhelmingly abundant. It consumed certain duck foods, and, in consequence, the open-water ducks, which before had abounded, all but disappeared from these marshes. Verification in this regard is afforded in the results of a study of the records of kill of the Winous Point club, made some years ago at the instance of the club by Dr. T. S. Palmer, of the Biological Survey. These results have not been published, but Dr. Palmer has courteously permitted the writer to examine them.

Sharp-shinned, Cooper's, and Red-tail are as nesting species extinct; and the Towhee and Chickadee may be expected to be found sparingly.

Consideration of the lists of species actually observed will reveal these things:

Certain crescent species are present in larger numbers today than they were in 1880; notably the House Wren and the Bobolink.

Three introduced species, the European House Sparrow, the Pheasant, and the Starling, have attained normal abundance. Of these the sparrow alone had in 1880 made its appearance in the vicinity, and it then was a newcomer.

There seems to have been some advance of forms of southern association into the region. Dr. Langdon mentions the Yellow-breasted Chat as a bird which he expected but failed to find. It was found in 1930, and with it the Prothonotary Warbler. Dr. Langdon notes the Cardinal as rare; but in 1930 the Cardinal was found to be common, and present in all suitable places.

Certain recessive species have dwindled or disappeared, notably the Cliff Swallow, and also those orchard-frequenting species, the two orioles, the Chipping Sparrow, and the Bluebird. The Dickcissel is doubtfully holding its own.

The birds of prey, excepting the Bald Eagle and the Screech Owl, which still persist, were even in 1880, practically gone. Now they seem to be gone altogether. Neither the Marsh Hawk nor the Short-eared Owl, to which the environment is peculiarly suited, remains to breed. This condition is due, of course, to the widespread and deplorable misunderstanding of the place which these birds properly occupy in an avifauna, and to the all but universal practice of shooting them on sight. With the two exceptions named, there are no birds of prey at Winous Point in the nesting season.

For the rest, and in the main, the two lists are virtually identical. Although such terms, employed by Dr. Langdon, as "rare," "common," "abundant," and "very abundant," are relative; still, the general condition is indicated with sufficient precision, and this general condition has been found to remain unchanged.

That such is the case is reassuring. The Winous Point Club is eighty years old, and its territories today present physical con-

ditions of water, marsh, and woodland, identically as they were fifty years ago—indeed as they were primordially. The passing over of frequent aeroplanes is but a distant reminder of an altered world. Nor has there been during fifty years considerable change in the adjacent farm-land. This much is fairly to be deduced: that even in this world of change and of confusion, Nature remains constant. Wherever by care or by accident a particular ecology is in other respects preserved, a particular element of that ecology (it is the avifauna that we have been considering) will continue.

Sewickley, Pennsylvania.

THE SENCKENBERG MUSEUM,[1] FRANKFORT-ON-MAIN, GERMANY.

BY ELSIE M. B. NAUMBERG.

IN 1817, twenty-two citizens of the free city of Frankfort-on-Main, founded the "Senckenbergische Naturforschende Gesellschaft." The Senckenberg Museum was then established at the Eschenheimer Gate, an old part of the city, and was opened to the public on the 22nd day of November 1821.

In 1904–1907, the same society built the present Museum situated in the Victoria Allée, and in 1914 founded the three University Institutes for Zoology, Geology-Paleontology, and Mineralogy and added another building.

Today this Society, with more than twelve hundred members is one of the most substantial scientific organizations in existence. The Museum is entirely supported by voluntary contributions and by occasional legacies. Only in times of great need does the city contribute towards the support of one of the finest museums in Germany. The society publishes a popular natural science periodical and two scientific journals. It provides the University, free of charge, with three well equipped scientific institutes as well as with a large and increasing library. Its main purpose is to hold popular meetings for the people of the city, who in spite of personal trials and tribulations, constantly bear in mind the ideals of science.

On the ground floor of the Museum are two lecture halls, the mineral collection and the geological-paleontological specimens, also the administrative offices, the department for preparing material, a carpenter shop and a small printing establishment.

The zoological exhibits as well as the large lecture hall are on the first and second floors. The latter is used for lectures whenever a large number of members are in attendance. The study collections are kept on the top floor and are not open to the public. However, any collector desirous of knowing something about the various specimens, may have them shown to him by the curators. There are many voluntary workers on the scientific collections and

[1] Translated in part from "Das Senckenberg Museum."

their activity for the past one hundred years has been of great importance to the life of the Museum.

The large paleontological and zoological specimens are on exhibition in the enclosed court-yard. Most conspicuous are the reptiles of the remote past, amongst the more important being the sea-saurian and largest land animals, and the dinosaurs. Here as well as in the other departments the name of the donor is indicated so that it is easy to form an idea of the manner in which private citizens through their legacies have enriched the collections.

In the hall to the right on the ground floor the plants and invertebrates of remote ages are represented by several valuable specimens. The mineral collections including many beautiful ores are located in the hall to the left. In the transverse hall behind the court yard is a collection of mammals belonging to prehistoric times. A collection showing the history of the earth and the workings of the forces constantly transforming the earth has not been placed on exhibition for lack of space. A collection of useful minerals and precious stones and a collection useful to the various branches of industry and to the nature lover are conspicuous by their absence. There is a great deal of material in the study collection which could at any time be put on exhibition.

A small portion of the bird collection may be seen on the first floor to the right. The small adjacent collection of fish and reptiles will shortly be removed to the second floor, thereby making way for a larger exhibit of birds and mammals. Two groups, one showing animal life on the African plains and another depicting the fauna of the Arctic Zone are on view in the small passage-way which leads to the other side of the building.

The collection of mammals may be seen on the first floor to the left of the court yard. The collection of comparative anatomy formed exclusively by voluntary workers as well as a small collection of native vertebrates are located on the second floor, while the invertebrates including a very fine entomological collection are to the left. Only a portion of one of the finest collections of mollusks in the world is on exhibition.

Throughout the museum appear the names of generous citizens of Frankfurt, who from time to time have been good enough to forward the interests of the Senckenberg Museum. All members

enjoy the same privileges. They and their families have access to the exhibits and study collections at all times. They have also the right to attend all Saturday and Sunday lectures and other functions. It is their privilege to make use of the library and to receive the periodical of natural history which the Museum issues.

COLLECTIONS IN THE SENCKENBERG MUSEUM.[1]

Frankfort has something over 100,000 birds and is believed to have the largest ornithological collection in Germany. At present all of Rüppell's and Cretzschmar's types are at Frankfort. Here also are a number of Kittlitz's[2] paratypes, among them one (of the four) *Geocichla terrestris* and two *Chaunoproctus ferreirostris* from Boninsima, both supposed to be extinct and also some types of Finsch, Hartlaub, Bonaparte, Reichenow and Hartert (e. g. *Otocoris berlepschi*).

The Senckenberg Museum also has the collection of Carl Parrot, of Munich including nearly 2000 skins from the Palaearctic Region, and five types from the Balkan Peninsula. The writer has worked on the more recent acquisitions of the Duke Adolf Friedrich of Mecklenburg's collection from Central Africa. Dr. Huy's collection from the interior of Cameroon, Elbert's collection from the Sunda Islands, R. Merton's collection from Aru Felde, H. Voeltzkow's from Aldabra, and other islands off the east coast of Africa, W. Kukenthal's from the Malay Peninsula, etc., belong also to the more recent acquisitions. A full account of Carlo von Erlanger's collection was published by Hilgert (Friedlander & Sohn Verlag.). This is one of the most important collections in the Museum, and was presented by Erlanger after an expedition to Algeria, Tunis, and northeastern Africa, together with all the mammals and bird skins he collected there.

The von Berlepsch Collection.—This outstanding collection, composed of about 55,000 specimens, was purchased by the Museum

[1] Some of this information has been supplied by Dr. C. E. Hellmayr, of the Field Museum, Chicago, and Dr. Ernst Hartert gives a good account of the early history of the collection in the introduction to his "Katalog," 1891.

[2] Baron F. H. Von Kittlitz, of Frankfort, the famous Naturalist of the Russian Sloop "Seniavin," visited Chile, Kamchatka, Alaska, the Aleutian Islands, Guam and Boninsima, discovered and described many species from this region. Cotypes of his species are at Frankfort and listed in Hartert's Catalogue.

during the Great War (in 1916) from the widow of Count von Berlepsch.

The writer had the great privilege of going to Schloss Berlepsch (near the city of Cassel, in Germany) to assist in packing and transporting this rare acquisition. She was accompanied by Dr. C. E. Hellmayr, and her good friend Robert de Neufville, of Frankfort, recently deceased. The wonderful opportunity of viewing this famous collection and many of its glorious specimens was in no wise marred by the shortage of fuel and food incident to that period of the War. We left Frankfort provided with a little bread, some "sausage" and a home-made cake, all of which were considered most luxurious articles in March, 1916. The writer slept in a room with stone walls dating back to the eleventh century. Not even a roaring fire started each morning at 7 A.M. succeeded in dissipating the moisture, or in moderating the cold and dampness of the air. Although the writer unpacked the collection upon its arrival in Frankfort, and arranged the specimens in cases according to families, yet she had no opportunity to do any appreciable additional work on the collections themselves.

There are approximately 280 type specimens composed mostly of species and subspecies described by Count von Berlepsch (partly in conjunction with Jean Stolczmann). Other authors' whose types are in the collection are Kleinschmidt (1), Taczanowski (3), Salvin (1), Hellmayr (11), Sharpe (1).[1]

Original Collections.—These are based on about 4000–5000 skins collected by the Garlepp Brothers in Bolivia; about 200 skins collected by Otto Garlepp in southeastern Peru; and specimens collected by Gustav Hopke (Rio Dagua and Rio Putumayo), in the Pacific region of southern Colombia.

A. Schulz collected in Pará and on the lower Amazon; E. Peters in Curaçao and northern Venezuela; M. Trujillo in Jalapa and Chiapas, Mexico; H. von Ihering in Rio Grande do Sul, Brazil; George K. Cherrie and F. C. Underwood in Costa Rica; and Kubary in German New Guinea (Konstantinhafen).

Part of the collections comprising the von Berlepsch collection were made by E. Hartert in the Dutch West Indies and by O. T. Barron in northern Peru; by J. Kalinowski in central and eastern

[1] Information received from Dr. C. E. Hellmayr, Field Museum Chicago.

Peru; by G. Garlepp in northern Peru; by H. Whitely in British Guiana; and in Turkestan by T. Barcy whose material was sent to Warsaw, Poland, and was worked up by Stolczmann.

Especially noteworthy are the collections of Hummingbirds represented by 5356 skins and 507 mounted specimens of 500 different species, including 20[1] types.

The Tanagers are also well represented by about 3400 skins and the Ramphastidae by 300 or more skins.

Rarities.—The collection contains only one Passenger Pigeon and four Carolina Parrakeets but many rare species from the Hawaiian and Galapagos Islands, and Birds of Paradise from New Guinea.

It may be said that the von Berlepsch collection was in general a well-rounded one; while tropical America was predominantly represented the collection was also rich in Palaearctic and Indian material, though weak in African and Australian.

Even as far back as 1828 there were plans for enlarging the museum after Edward Rüppell returned from an expedition to Egypt with many remarkable specimens, and started corresponding and exchanging his material with all the large museums and well-known scientists. In the same year he again started for the interior of Africa, and from the coast of the Red Sea proceeded to the highlands of Abyssinia bringing back large quantities of material. These collections also required more storage space and in 1841 the store-rooms of the Museum were again enlarged.

The political conditions in 1848–49 were not especially conducive to the advancement of science, particularly in Frankfort. However, in 1854, the Society started issuing the 'Abhandlungen' which have appeared at regular intervals down to the present time. After the wars of 1866 and 1870, a period of peace followed, and some collections were made in the colonies by young men, who, upon their return, presented the museum with much valuable material. After the fiftieth anniversary of the Museum, at which time the Rüppell legacy was created, there were many and varied expeditions. The local geological collection of Albert von Reinach was made during his lifetime in the mountainous region of the Taunus, near Frankfort.

"With ideas of establishing conditions of reciprocity between

[1] These numbers were furnished by Dr. C. E. Hellmayr.

museums, with the idea that one of the extraordinary examples of the remote geological past will prove of influence in the advancement of science,"[1] Morris K. Jesup commissioned Prof. Bumpus, of New York, in the fall of 1907 to donate to the Society the specimen of a *Diplodocus* which still has a distinguished place in the court of honor. "The *Diplodocus* which represents one of nature's final efforts toward the establishment of physical supremacy."[2]

All visitors view with pleasure the new scientific Museum on modern plans in Frankfort, a city widely known as educationally progressive.

American Museum Nat. Hist., New York.

[1] Prof. Bumpus' speech at the opening of the new Museum, 1907.

A STUDY OF THE EASTERN SONG SPARROW, *MELOSPIZA MELODIA MELODIA.*

BY DORIS W. HALDEMAN.

THIS paper presents the results of rather extensive observations at the nests of *Melospiza melodia melodia* during a period of six weeks in the summers of 1928 and 1929, with more casual observations during the rest of the time.

Habits.—The Song Sparrow is a conscientious mother. The bird which I observed during the summer of 1928 began the construction of a fourth nest of the season on the fourth day after the young of her third brood were destroyed. This was surely evidence of adherence to the maternal instinct, since two broods are the usual number.

What fighters they are at times! One Song Sparrow, feeding in the yard, sometimes drives away five or six House Sparrows or White-throated Sparrows, both larger than she, and then enjoys the food in peace. This is the more remarkable since the House Sparrow is usually more belligerent than the Song Sparrow.

The Song Sparrow is usually very active when trapped, but occasionally quite docile. Even though a bird may seem wild when trapped it returns again to the same trap, learning very quickly the source of a full meal. I trapped Number 24947 seven times between April 8 and May 28, 1928, after having banded it on April 8. Number 24948, banded April 8, returned to the same trap six times between that date and May 24.

Territory.—The two birds I observed during the summer of 1928 offered an excellent opportunity for a study of territory. During the period in which the fledglings were in the nest, the birds occupied a very limited area. This was especially true of the female. She obtained all of the food she gave from the bush in which the nest was located, and the mulberry tree which was about ten feet away. The male was seldom out of sight of the nest, staying always in the upper part of the garden.

After the young birds had left the nest, the parents were seen and heard in a much larger territory—in the lower garden and in the woods opposite the garden. Only one of the young birds was

seen. I had banded it with a pink and a white celluloid band similar to those used by W. K. Butts in his work, so the bird could be easily recognized. The banded parents were found in the vicinity of this young bird.

Six days later the female was busy with her next nest. During the incubating period the nest was deserted so frequently that I feared the eggs would not hatch. This was the third brood of the season. The territory at this time was quite large. This nest was about one hundred feet from the former one. The territory included all of the former area and the space around the new nest, being about twice the size of the former territory. Often the female arrived from out of sight, incubated for a short period of time, and then flew away, sometimes to a distance of twenty-five feet, to feed on the ground. Occasionally she flew out of sight. As the days passed the time spent away from the nest decreased—and she remained in a very limited territory.

The male, in the meantime, enjoyed a large territory. He was to be found with the young bird of the former brood, and in the old territory, and in the area near the new nest.

Toward the end of the incubating period the female confined herself to a very small area, indeed, never being more than ten feet from the nest. After the birds had hatched, the female was constantly at the nest, leaving it only long enough to get food from the immediate vicinity for the young birds.

On the third day of the life of these birds the young bird of the former brood and the adult male were frisking about very near the nest. The male was now usually in a territory near the new nest.

This nest was destroyed when the young birds were five days old. For a time the female was not in evidence. The male sang from various perches—again wandering about with the young bird.

After three days, the female was discovered building a new nest about one hundred feet from each of her former nests, so that the three nests formed an almost perfect equilateral triangle. While actually employed in nest building, the bird remained in a very small area, but much of the time she spent elsewhere, returning to the site of the new nest, usually accompanied by her mate, from considerable distances. Unfortunately, I was able to make observations for only a few days longer, so that the extent of the

territory of the fourth brood was not learned. The first nest, Dr. Allen said, had been broken up early in the season. I had observed the second and the third broods.

To summarize my findings, I might say:

1. That the territory occupied by the male is larger than that occupied by the female during nesting season.
2. That the adults are found in the vicinity of the young when there are young on the wing.
3. That the territory occupied by both birds is much larger when there are neither eggs nor young.
4. That the territory of a subsequent brood includes the original one.

Since these observations have to do with but one pair of birds no definite conclusions as to the territory habits of Song Sparrows can be given. The summary, however, is quite in accord with Howard's[1] theory of the part played by territory.

Song.—One of the first things I noticed about the male Song Sparrow which I observed for six weeks was his fondness for two perches, one in a plum tree to the right of the nest, and the other in a dead cherry tree a little to the left and behind the blind from which I made my observations. The cherry tree perch was the favorite one. He seldom sang from any other spot.

When his territory was enlarged during the next nesting period he selected two new perches. The dead cherry tree had been removed, and the plum tree was, seemingly, too far from the new nest. He sang at times from a position on the telephone wire as near as possible to where the dead tree had stood. At other times he burst into song from the wire along the road on the woods side, nearer the new nest. He now had young on the wing in the lower garden and in the woods, and he sang occasionally from each of these localities. Here he sang from a number of different perches, not revisiting the same one with any great regularity. A few days before the eggs hatched in this third nest the male added a new perch to the other two usual ones, and from that time on he sang frequently from the maple tree near which the dead tree had stood. After the eggs had hatched the proud father sang not infrequently from a fence post quite near the nest. After this nest had been

[1] Howard, H. Eliot—Territory in Bird Life, 1920.

destroyed the bird sang from various perches, in the lower garden, in the woods, near the nest. During the days when the female was not seen, the male continued to sing and call in a territory constantly increasing in size. When she returned and began to construct a new nest his song came from the old, frequented perches, although his territory remained large for several days.

I began to make daily observations of the pair of Song Sparrows already mentioned on July 2. The male sang frequently and with a great deal of spirit during most of the month of July. On the 27th, the day the second set of eggs hatched, he sang frequently, but his song was subdued. On July 30 he sang his usual song but with no volume, the end being scarcely audible. His singing was constant. Later, on the same day, he sang with a volume that was only slightly less than at the beginning of the month. This was soon followed, however, by the subdued song.

On August 4, the day the female began the building of the fourth nest, the song of the male was quite short. On August 8 there was one egg in the nest. The proud father sang frequently, with full volume and much variation from all of his various perches, near the new nest, near the former nest, in the lower garden where he had been seen and heard with one of the young birds of the second brood, singing as though proclaiming to all the world the glad tidings of promise of a fourth brood.

On the twenty-seventh day after hatching I heard a young Song Sparrow make an attempt at song. It was short and weak, and had I not seen the bird, and identified it as one recently banded with colored celluloid bands, I could not have recognized the song as that of the Song Sparrow.

I have noted a midday relaxation in July. Singing is most constant early in the morning and early in the evening, but the bird sings at all hours of the day. When one is in the territory of a Song Sparrow it seldom takes many minutes to locate the male. His song soon calls attention to his presence.

On July 5, 1928 the moon was fading and a few stars were still shining when, at 3:50 A.M., I heard the first bird note—a Robin's call. The day was damp and cold, and rain came before 8 o'clock so all the birds were late that morning.

3:52 Pewee called and continued to do so.

3:55 Wood Thrush sang a number of times. Other Wood Thrushes answered.
4:01 Crested Flycatcher and Veery sang.
4:05 Concert of all these birds.
4:07 Catbird called and then sang.
4:08 Crow flew over head and called.
4:11 Wren sang.
4:13 Song Sparrow sang.
4:18 Full chorus of bird voices.

At 6:45 P.M. the evening concert began. The Robins' voices were conspicuous at first, the Flycatchers' later and those of the Veery and Wood Thrush still later. Between 6 and 6:45 the Song Sparrow sang nine times. At 6:46 he repeated his song seven times. Between 7:35 and 7:40, after the other birds had become comparatively quiet, the Song Sparrow sang five times, and from 7:40 to 7:45 he sang constantly. At 7:50 he sang twice and at 7:55, once. Then all was quiet. These figures, although interesting, do not carry the weight of those given by H. W. Wright, 1912, '13, '15[1] and F. H. Allen 1913, 15[2] on the subject, since they are based on one day's observation, and not on a study covering a long period of time.

Call.—After I became somewhat acquainted with the habits of my pair of Song Sparrows, I was able to interpret some of their calls. One morning when a crow was flying low, calling, the male gave a sharp, "Dick, dick!" evidently his note of alarm to the female who remained on the nest and gave an answering chirp. Shortly afterward a baby Robin flew into the bush with the Song Sparrow nest and moved around quite a little. This seemed to greatly alarm the mother bird. She left the nest only infrequently, and, when she did leave she returned immediately and without food, keeping up constantly a chirp of alarm.

On the sixth day, in the afternoon, I heard the young birds for

[1] Wright, H. W. 1912. Morning Awakening and Even Song. Auk, vol. 29, p. 307.
1913. Second Paper. Auk, vol. 30, p. 512.
1915. Morning Awakening Notes at Jefferson Highland. Auk, vol. 32, p. 240.

[2] Allen, F. H. 1913. More Notes on Morning Awakening. Auk, vol. 30, p. 229.
1915. Notes—The Status of the Song Sparrow and Chipping Sparrows as Early Birds. Auk, vol. 32, p. 110.

the first time. Their first food cries were feeble, but they soon became very decided and were given with great frequency. On the seventh day, when one of the young birds had left the nest, it kept up a continual crying. The parents paid more attention to it than to the two still in the nest, probably because its voice was stronger, more persistent, and more continuous, and because they had the new experience of having an off-spring out in the world, The parents were very attentive, but did not offer food as frequently as they had on the preceding day.

After the young birds had left the nest, the adults were frequently found near each other on the ground, moving about, constantly chirping. The chirp was, probably, a means of keeping together, and of keeping the young birds near them. Occasionally a faint chirp came in answer from the undergrowth. This was so similar to the chirp I heard one of the young birds giving while he was in view that I feel certain it came from one of them.

During the incubation period of the third brood, the adult birds were frequently in evidence hopping around on the ground on opposite sides of the road, calling to each other, "chimp," in alarm. The female seemed much more nervous with this nest than with the former one. Perhaps this was because the nest was along the road, and was therefore not so quiet; and yet, since the children were not near it frequently as they had been near the former nest, the female did not become accustomed to having someone near the nest. For days she made no sound when near the nest, and left quickly whenever she was alarmed.

A young bird from the former brood was occasionally heard "tzip"—almost like the call of the White-throated Sparrow.

On the day the third brood hatched the female frequently, on the least provocation, gave her alarm cry "chimp." While I examined the young birds, both adults were greatly concerned and kept up a constant "chimp." As they saw no harm coming to the young the cries became less persistent and more subdued until finally fear seemed to go. The male soon began to sing, and the female brooded constantly even though she knew I was near.

When the male had finished his song he gave a sharp, metallic "chip," flew to the ground in search of food, and became busy with family cares. That "chip" seemed very expressive. While the

female was brooding she said, "pip, pip" very softly, and then purred loudly in a most contented manner. The next morning the brooding female said, "Bura-Bura-bura-brrrr." These two calls seemed to express contentment, satisfaction.

After this nest was destroyed and the female disappeared for three days, the male called very frequently from all parts of his territory, as though he were searching for his mate. After her return, the birds were frequently seen together calling to each other. From these observations it seems that the call notes correspond to conversation, and that the vocabulary of the Song Sparrow is rather extensive.

Nest.—It is probable that no two nests are exactly alike. Each nest is made of materials most easily obtained, and this factor will of course necessitate variation. I was fortunate in being able to make observations at three successive nests of my pair of Song Sparrows in 1928.

Nest 1.—The foundation was of grapevine bark and coarse grass stems, some of which were 3/16″ in diameter, many of which had the roots attached. The stems varied in length from less than three inches to very long pieces which were twined in and out. The outside of the nest was much more loosely constructed than the inside. The stems toward the middle of the nest were much finer, and on the whole longer than those in the outside. The nest was lined with a horsehair and many short pieces of grass—the average length 3″. The nest was not perfectly round on the outside, outside measurements 5½″ x 4¾″. The inside of the nest, having been shaped by the mother's breast, was round with a diameter of 2″. The depth was 3″, inside depth, 1½″.

Nest 2.—The foundation was made entirely of coarse stems most of which had the roots attached. The nest had a very thin middle layer made of finer stems. The lining was, again, made of fine grasses. This time there were a few grass stems and a very few hairs in the lining. At the very bottom of the outside of the nest there was a piece of moss about 1¾″ long. Attached to a root of one piece of coarse grass was a hard bit of soil in which there was a very short piece of moss. The nest was much looser and thinner walled than Nest 1. The outside measurements were 5½″ x 4½″, inside diameter, 2″; outside depth, 2½″; inside depth, 1¼″.

Nest 3.—The foundation contained one piece of grapevine bark, and coarse grass stems many of which have roots and fruits attached. As in the preceding nest, there was a thin middle layer of fine stems. The nest was lined with fine grass, and two black horsehairs, and two human hairs 4″ long. This nest was much more untidy than the preceding ones, much less compact. The outside measurements were 7¾″ x 5¾″. Loose grass stems extended on all sides of the nest. If they are considered, the outside measurements would be 15″ x 12″. The inside diameter was 2¼″, outside depth 3¾″; inside depth 2″.

Nest 4 and Nest 5 are nests of the same pair of birds in 1929 both built on the ground and about 150 feet down the hill to the westward of those of 1928.

A comparison of these nests seems to indicate that the early nests, which are quite likely to be built on the ground are more neatly and compactly built than succeeding ones. The variation in materials is due to a difference in availability—when horsehair is obtainable it is used. Grapevine bark makes a more compact foundation. Its presence in abundance in the earliest nest probably made a warmer home early in the spring than grass stems would have made. The early nest, being made of comparatively short pieces of dry grass of the preceding year, can readily be made neater than the later nests made of growing, non-brittle grass, many pieces of which are 1½ feet long.

On August 4, 1928, I watched this Song Sparrow begin her fourth nest of the season, the third one I described. She began at 7:30 A.M., putting down a foundation of strips of grapevine bark and stems of coarse grass, loosely arranged. She worked very fast, carrying pieces of dry grass 8″ or 9″ long. Some of this she pulled out by the roots, some she broke off from above the ground. Much she discarded without any apparent cause. Sometimes she carried two pieces at once. Once she tried to carry a piece about 15″ long with fruit at the end. The grass was so heavy that the bird could not rise from the ground on the first attempt. After frequent attempts she managed to fly a short distance, and after a short rest flew on to the nest.

When she returned to the roadside, from which she was obtaining most of the nesting material after she had finished the grapevine

bark foundation, she pulled at a fresh, growing plant, placing her bill on the stem down near the ground. The stem did not break. The persistent little bird tried three times, and then flew away, returning soon with a piece 15″ long. She pulled at two more green plants unsuccessfully before she succeeded in finding a plant dry enough to snap off readily.

In the meantime, the male sang occasional short snatches of song. The female frequently pumped her tail up and down. After a time she almost never flew to the nest without two pieces of grass. Holding one long piece in her mouth she pulled a second piece out by the roots. So she continued flying back and forth to the developing nest for over an hour. Then she changed her path of approach to the nest, probably for more careful arrangement of the materials. Some of the grasses she attempted to pull out gave her such difficulty that, although she pulled apparently with all of her strength, so that she almost fell, it was necessary for her to walk away with the grass in her mouth, and even then there were unsuccessful attempts.

I watched the process for almost two hours and returned again at 1 P.M. to find the busy little bird carrying a piece of grass 2½ feet long. The nest was well under way, carefully hidden in the spruce tree. After about half an hour, during which the female worked industriously, the male flew to one of his favorite perches near by and sang. The female flew away with him and had not yet returned at the end of another half hour.

In the morning the mass of stems had not resembled a nest, but now it was carefully shaped, and the grasses were woven together instead of being, as in the morning, merely placed in position. The grass was not yet dry and the whole nest felt withered.

The next morning I found the nest finished—deep and perfectly formed. The female was hovering near in the hedge. There were many long pieces of grass on that, and on near-by spruces.

Of the five nests which I have described the first was in a barberry bush, the next two in a spruce hedge, and the fourth and fifth on the ground. The first three were all about three feet from the ground. Of the nests which I have seen in Philadelphia, Phoenixville, and Center Bridge, Pennsylvania; and Ithaca, New York, those which have been at least two feet above the ground

have raised more families than those lower, either in bushes or on the ground. The Song Sparrow is so tame that it builds its nest quite near houses, in flower beds, and even in a rose bush (Condor, Volume 19, page 34). The bird's fondness for water explains the fact that not a few nests are found in bushes overhanging a stream, sometimes a few inches above the water, sometimes several feet above it.

Eggs.—The pair of Song Sparrows I observed during the summer of 1928 returned to the same garden in the spring of 1929, and were recognized by their bands. The male was first noticed on March 12, the female, some days later. On April 26, they had three eggs in a nest on the ground. Early in July they were busy with the third family, having successfully raised two broods.

The bird does not begin to incubate until the last egg to be laid is in the nest. There were four eggs in a nest which I observed. The female did all of the incubating, but left the nest frequently—for food, for a visit with the male, or because she was scared away by some disturbance near the nest. On the morning I began my observations, the adults were hopping around on opposite sides of the road, calling to each other. The female made frequent visits to the nest, fed in the spruce hedge near it, but did not begin to incubate for half an hour. Then she was soon frightened away by children who passed near the nest. She stayed away for six minutes, incubated for fifteen minutes, and deserted once more.

On another day, toward the end of incubation, her behavior was much the same. I arrived at the nest at 8:25 A.M. The male was singing, but the female was not in evidence. At 8:40 she appeared. She stood perched on the wire of the fence near the nest and carefully preened her feathers over and under the wings, the breast and neck, and shook all her feathers once more. Then she fed on the ground and in the hedge within twenty-five feet of the nest. At 9 o'clock she began to incubate. After five minutes she again flew off. At 9:20 she returned. She seemed nervous and left the nest at my least move, returned at once, moved around near the nest for three minutes, then settled down for seventeen minutes. Then the presence of a House Sparrow near the nest alarmed her, and she left quickly. When she returned she again preened her feathers before settling on the nest. For the rest of the morning she was

never away from the nest long, but she did not incubate constantly.

On another day, at 1:50 P.M., the bird was not at her nest; the eggs were cold. Ten minutes later she returned from the lower garden. She was not so nervous as on previous days. My presence did not annoy her at all, and she was not frightened by passing cars. Again her periods away were almost as long as the periods when she incubated.

On the day before the eggs hatched the bird's behavior was much as it had been before, except that she was unusually alert to all bird sounds.

Each day during the incubation period the female turned the eggs with her feet and bill so that each egg was evenly heated.

Usually the bird sat very low in her nest so that only her tail, or sometimes only the very end of her tail, was visible at a short distance from the nest. Two days before the eggs hatched her position was not so low as it had been. Her head, as well as her tail, was visible. At all times she was perfectly quiet when at her nest. Her approach and departure were also quick and quiet.

During most of the incubation period the male sang from his various perches. I never saw him at the nest. Toward the end of the incubation period he became more quiet than was his custom, when he was in the territory near the nest. He spent most of his time not far from the nest.

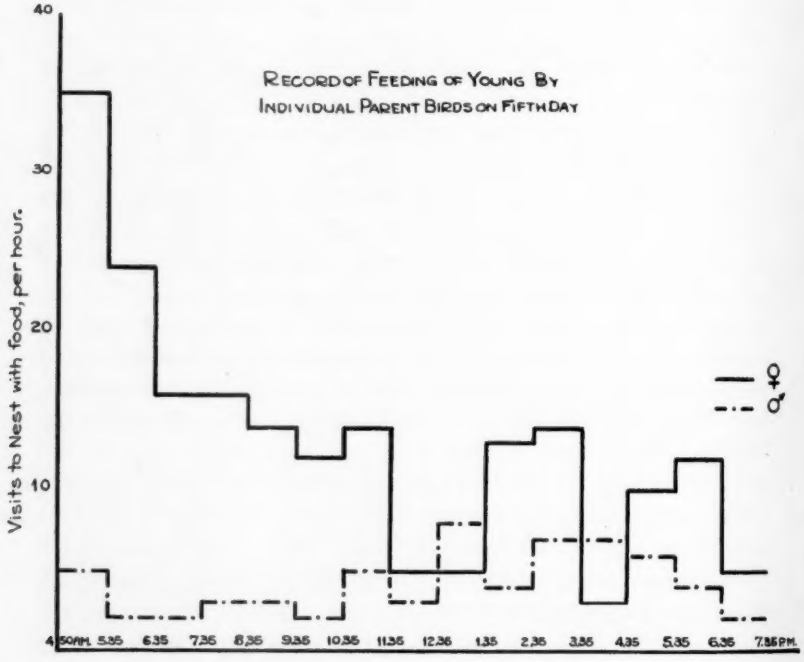
Care of young.—After the eggs had hatched, both parents became very much absorbed in the care of the young birds. The pieces of empty egg shell were carefully removed by the mother bird, carried away one piece at a time in her bill, and dropped some distance from the nest.

I marked the four young birds which I studied by tying threads of different colors around the right legs. The increase in total length of the birds from day to day is shown in the following figures:

	Rose	White	Black	Green
July 27.....	1 5/16″	1 5/16″	1 8/16″	not hatched
28.....	1 6/16	1 5/16	1 14/16	1 3/16
29.....	1 14/16	1 12/16	1 15/16	1 8/16
30.....	2 2/16	2 2/16	2 4/16	1 10/16
31.....	2 4/16	2 4/16	2 6/16	1 12/16

On August 1, the young birds were destroyed, probably by a cat which had been seen in the vicinity of the nest.

It is interesting to note that the two birds which hatched the same length were equal in length at the end of five days, although on the 2nd and 3rd days the "rose" bird grew more than the "white" one. The bird which began life the largest of the brood was still the largest of the brood on the fifth day. The runt was still the runt, and had not increased in size as rapidly as the other three birds.



During the first three days of the life of my four young Song Sparrows they were fed nothing but regurgitated food by the female when I was observing. Since my visits were made at different times of the day, and lasted for 30 to 65 minutes each, it is perhaps safe to imply that the young were fed little undigested food during this time. On the fourth day, I again found the female brooding almost constantly. Occasionally she cleaned the nest,

picking for lice which she fed to the young birds. Seven times during the hour from 7:30 to 8:30 A.M. she fed regurgitated food. Once she ate a piece of straw from the nest, regurgitated, and fed. When she fed regurgitated food a number of young were fed at the feeding. On this day feeding was infrequent and consisted entirely of lice from the nest and regurgitated food.

On the next day, when the young birds were five days old they were fed more frequently than on previous days, and were fed insect food,—caterpillars and grasshoppers, by both male and female. Since these young birds were destroyed no further data can be given for them.

I had, however, observed a previous brood of the same pair from the day when they were, according to Dr. A. A. Allen, probably three days old. On the fourth day the female fed regurgitated food, small flying insects which she caught as they flew by the nest, and lice from the nest. The male occasionally fed a small insect. On the next day I observed all the happenings at the nest from 3:50 A.M. until 8:10 P.M. The adults were very busy. For 10 hours, during which I kept record of the kind of food given, of the 171 pieces of food given, 74 pieces were of animal origin, 56 of plant origin and 41 unknown.

Animal		*Plant*		*Unknown*
Unrecognized insects	32	Mulberries	47	41
Caterpillars	19	Barberries	8	
Grasshoppers	17	Straw	1	
Lice	4			
Butterflies	2			

The male fed only insect food; in the morning the female fed mulberries, barberries, lice from the nest, and a few insects caught at the nest. In the afternoon she spent more time searching for food, and fed more insect food.

On July 5, 1928, when my observations began at 3:50 A.M., I recorded the number of feedings given each hour.

The young birds, hungry after long hours of the night without food, were fed more frequently during the first two hours than during any other hours of the day. It rained from 8:20 A.M. until 3:50 P.M. The rain seems to have had no effect on the frequency

of feeding. The decrease in the number of feedings at noon seemed to indicate a mid-day rest period. The decrease between 3:35 and 4:35 was occasioned by the female's dislike of an experiment I tried. In order to study the frequency with which each of the young birds was fed I marked them in a certain way which will be discussed later. The female spent her time trying to remove my identification marks instead of feeding the young birds.

The faithfulness of the male and of the female during the course of the day is shown by the following graph.

A glance shows that the female did most of the feeding. During the second hour of the female's mid-day rest period, the male exerted himself a little more than at any other time during the day. During that hour, and during the hour, already referred to, during which the female's attention was distracted, the male fed the young more frequently than the female did. Of the total 261 feedings during the day, the female gave 198, the male, 63.

For the first three days after hatching, feeding seems not to be a very important item. The young birds are frequently left alone; and when the female is at the nest she spends most of her time brooding. On the fourth day, the parents become a little more devoted, bringing food three or four times an hour. On the fifth day, in the three hours time during which observations were made, the birds were fed 10, 20, and 15 times respectively. During the same three hours on the next day, the day for which the figures have already been given, the birds were fed 19, 17, 14 times. The variation in these two days, is not great but there is an increase in frequency as the birds grow older rather than a decrease. The figures given for the earlier days seem to indicate an increase as the bird grows older. This problem could not be definitely answered, however, without constant observation at a nest from the time the eggs hatch until the birds leave it. The problem presents obvious obstacles, but perhaps it will be solved at some future time.

The parent, on visiting the nest with food, usually feeds one bird; frequently two are fed; occasionally three. All previous figures have referred to a parent's visit, the actual number of feeding is therefore somewhat larger than the numbers given.

Number of Nestlings Fed	11.35	12.35	1.35	2.35	3.35	4.35	5.35	6.35
One.....	4	9	11	14	7	11	8	4
Two.....	2	4	6	6	3	3	7	3
Three.....	2	0	0	1	0	1	2	0

The preceding table shows that in 108 visits made, the birds were fed 154 times. That is, each bird was fed on the average of 6.4 times an hour, or once in 9.3 minutes.

This is assuming that each occupant of the nest receives the same amount of food. This cannot be taken for granted. I frequently saw one of the adults give one bird a second mouthful while the other two birds held their mouths open for food, in vain. This led to an attempt to study the subject. I tied a brown cord, made by twisting threads from the blind, about the neck of one young bird, a piece of grass about the neck of a second, and left the third unmarked.

After the male had fed twice, and the experiment seemed to promise interesting results, the female returned to the nest. She carried food but dropped it on seeing such foreign matter as brown threads and grass in the nest. She removed both the threads and the grass. I again marked the birds in the same way. Again the female removed the identification marks, and seemed so disturbed that I gave up the attempt to solve the problem.

Judging from the development of the birds, however, the food was not equally divided. On the next day one of the birds left the nest in the morning. It was markedly larger than the other two. By afternoon one of them began to show signs of action, travelling to the edge of the nest and back. The third bird was decidedly smaller—decidedly the runt of the brood. It was easy to see that the large bird, being more active, and reaching higher for food, was likely to get a large share of what was offered by the parents.

After the hatching of the eggs, the female spends most of her waking hours searching for food for the young birds, feeding them, cleaning the nest, or brooding. Brooding, sitting on the nest with feathers puffed out and sometimes with wings partly spread, is a means of protecting the young helpless birds from the heat, cold, rain, and from enemies. As has already been stated, the female broods most of the time during the first three days. When the bird

is about to brood she pushes the young aside with her feet, in order to have them distributed in the nest to her liking, spreads out her feathers, especially those on her breast, spreads her wings and gently settles. Sometimes she pulls her head down into her feathers so that there is a straight line from her bill to the base of her tail. At such times, the tail, instead of being held at a jaunty angle, is flattened almost on a line with her body.

For two consecutive hours during my day's observation I kept a record of the time spent away from the nest, action on return, and time spent brooding. During this time the female was away from the nest 54½ minutes and brooded for 61½ minutes. In the entire period the male brooded for only one minute. That was the only time during the observation at two nests that I saw him brooding at all. It was during a heavy shower. As soon as the female returned to the nest he left. The female spent more time brooding during those two hours than she did in hunting for food for herself and the three young birds. This gives a good idea of the importance of brooding.

During the heaviest downpour, the female brooded constantly for thirty-five minutes. After that, although it was still raining, she spent her time hunting food, feeding the young birds, and cleaning the nest, for one and one-half hours, during which time she did not settle down once.

Cleaning the nest was a very important item. Both male and female participated. Nest cleaning consisted of removing the little white sacs of excreta, eating lice, eating bits of straw, and removing the identification marks already referred to. The female frequently seemed to stand on her head in the nest and to pick around vigorously with her bill, removing the lice. At first these were always fed to the young birds, but as the birds grew older, from the sixth day on, this was not done. The female ate them herself. I never saw the male searching for lice. Occasionally, the female ate a few pieces of straw from the nest. At first I interpreted this to be a sign of hunger, but since she picked a piece here, and one there, on one occasion five pieces altogether, I decided that the movement of the birds in the nest had made the nest appear untidy to the mother's eye, and that she ate the offending objects as a quick means of disposing of them. Just once I saw the male eat a piece of straw from the nest.

The female was much more sensitive to disorder in the nest than was the male. He returned and fed the young birds twice, apparently without even noticing my identification marks.

The following table shows the attention given by the male and female to the disposal of the sacs of waste matter.

Number of Sacs of Excrement Removed Per Hour by Each Parent from 4:35 A. M. to 7:35 P. M.

	to 4.35	6.35	8.35	10.35	12.35	2.35	4.35	7.35
Male	2 0	0 0	0 4	3 1	1 1	5 4	3 3	2 0
Female	0 3	3 1	5 0	0 3	5 2	4 1	3 4	9 3

In the course of the day, 74 sacs were disposed of, 33 by the male, 41 by the female. This work seems to be more evenly shared than is feeding. Most of the sacs were carried away. Seven sacs were eaten by the female, three by the male. Once the female swallowed four sacs, carried a fifth one away, and returned immediately for a sixth.

Each of my birds had a definite method of approach and of leaving the nest, so that even if the birds had not been marked with the colored celluloid bands I could have known which bird visited the nest on most of the visits.

Nest Behavior of Young.—The young birds, while in the nest, showed many interesting phases of growth. During the first three days after hatching they huddled together in the nest, and when disturbed reached open mouths up for food for a few seconds, then settled down again. By the end of the third day the larger ones reached for food when the bush was touched. There seemed to be, during these early days, no attempt at exercising; the only movement was an instinctive one, for food.

On the fourth day, the young birds made certain movements which could be interpreted only as stretching, a kind of exercise. One of the occupants of the nest, evidently tired of keeping still, stretched his neck. Neither parent was present with food, no movement had disturbed the nest from the outside, but the stretching of one bird caused the others to stretch their little necks upward and to open their mouths for food. When no food was given they settled down again. Since the parents were very faithful, and visited the nest with food very frequently, there were few move-

ments that could be considered as being made just for the sake of exercise.

On the next and on the succeeding days, the young birds became so active that the mother bird seemed to be squirming around in the nest whenever she brooded. Frequently, she rearranged her wings, while brooding for as short a period as four minutes, to keep the moving young ones covered.

When the birds were six days old, they stretched sleepily at 4:35 A.M. They were soon wide awake. The activities of the day have been described elsewhere. On this day, the young birds were very active, stretching their necks and little wings, and keeping the female constantly moving when she brooded. The largest bird preened its feathers early in the morning. All three birds showed considerable growth by the end of the day. After the rain, all of the young birds preened their feathers.

On the seventh day, the largest bird left the nest. Each time it was put back it hopped out again immediately and moved around in the bush. The middle sized bird was very active, moving about the nest, and stretching frequently.

The young birds, in the two nests which I observed, reached silently for food during the early days of their lives. I heard no food call, no sound of any kind from the young birds until the sixth day. Early in the afternoon faint cries were given whenever the young birds reached for food. These cries increased in volume as the afternoon advanced, so that by evening they were lusty chirps.

On the seventh day, the birds cried continually for food. The bird out of the nest, especially, kept up a continuous sharp chirp.

The young birds apparently did not develop the fear instinct while in the nest. I handled the occupants of the nest, and measured them each day for five days without any sound of protest or any show of fear. When each bird was returned to the nest it huddled down with the others, and then immediately stretched or reached for food.

On the seventh day, the day the largest bird left the nest, it showed some fear, hopping away whenever I approached it. The two birds in the nest crouched down when I approached the nest, but as soon as I withdrew, they stretched upward again. This seems to indicate the beginning of the fear instinct.

During the first three days, any sound near the nest and any movement of the nest or bush in which the nest was located caused the young birds to reach upward with mouths open. On the fourth and succeeding days any *slight* sound near the nest, any *gentle* movement of the bush near the nest caused the stretching of necks with wide open mouths; but any loud noise near the nest was ignored. There seemed to be no fear, but the growing birds were better able to classify stimuli so that they no longer looked for food whenever any disturbance occurred in the vicinity of the nest. During the entire time in the nest, however, a sound or movement like those made by the parent birds was responded to by the opening of mouths.

On the last day in the nest, the two smaller birds were removed and perched on a twig. The runt was so small and weak that it was unable to hold on and had to be returned to the nest. The middle sized bird held on to the branch, showed no fear, and after a time cried for food. The parents, however, were more interested in the largest bird, who had left the nest earlier in the day, and did not respond to the cries.

While the young birds were in the nest, there was no attempt on the part of the parents to train them. On the day before the first young bird left the nest, I observed every movement at the nest from before sunrise until after sunset, and I noted that the parents were very devoted, but made no effort whatever at training.

Behavior of Adults and Young after the Young Leave Nest.—After the young birds had left the nest, I heard occasional faint chirps in the garden but did not see the young birds for nearly a week. The adults were usually together near the old nest, or flying together into the lower garden or to the woods. On the sixth day after the first young bird left the nest, I saw the male and this young bird (both recognized by the colored bands) fly into a hemlock tree near the nest. From there they both flew to the dead tree, a favorite perching place of the male's. Here the young bird gave several weak chirps and then flew to the woods. The male followed it, sang from the telegraph wire at the edge of the woods, aand then flew to the lower garden. In a few minutes the young bird followed him to the lower garden.

Frequently weak chirps were heard in the undergrowth in the

lower garden during all the rest of the summer session. Several times, when the male was heard singing in the lower garden and in the woods the young bird was seen with him. The female was frequently seen with the male until she was engaged in raising her next family, the details of which have already been recorded.

Number of Broods.—As I have already stated, the pair of Song Sparrows I observed had four broods in 1928. The nest and young were destroyed the first and third times. No observations were made after the laying of the eggs the fourth time. Even an attempt to raise a fourth brood in one season seems rather unusual. I have found no such record in any of the ornithological journals. In 1929 at the beginning of July this same pair of Sparrows was busy raising a third brood, having successfully sent the first two out into the world.

Much more devotion was showered on the young of the second brood than on those of the third brood. Both parents were at the nest frequently in the first case. If the nest was deserted for half an hour the fact was remarkable. But even during incubation the third nest was frequently unattended. After the young had hatched, I, more often than not, found neither parent at the nest on my visits. Seldom were both parents there at one time, although in the case of the former nest, this was a frequent occurrence. When this nest was destroyed, however, the female took no rest before beginning her fourth. Seeming to realize the shortness of the season, she built this nest in two days, instead of taking, as usual, a week for the operation.

Raising Other Young.—In the third brood, in 1929, there were three Song Sparrows and one Cowbird. This is evidence of the industry of this pair of birds—the raising of even two of the legitimate young with a Cowbird is rather unusual.

Winter Behavior and Food.—In winter, I have seen, and occasionally heard Song Sparrows, usually alone or with one or two companions near dense shrubbery, or in piles of branches, sheltered from the wind. They seem to be somewhat exclusive, not associating much with other birds, but picking a scanty living in the fields and woods where there are weed seeds to be found, and finding shelter at night, so that they can stand even our occasional zero weather in Philadelphia.

Enemies.—The Song Sparrow has numerous enemies. Among the most serious are egg hunting boys, cats, and those who cut down trees and shrubs. The removal of many shrubs leads to the nests being built on the ground. Of the nests which I have observed, those built on or very near the ground raised fewer families than those at an elevation of four or five feet. Of the seven nests I observed between May and the end of July, 1928, only one raised a family to the nest-leaving stage. That nest has already been discussed. Of the others, one seen on the ground in Phoenixville, Pennsylvania, contained three eggs and the incubating female on May 10; on May 17, the nest was empty and deserted. A nest containing four eggs, found on the ground near the Cornell University campus on July 10, contained no eggs two days later. A nest found very low in a bush near campus on July 16 contained four eggs. On July 19 two birds had hatched, on July 20 the two birds were gone, the eggs were still there but the nest was deserted. A nest found about a foot from the ground against a fence post near Dwyer's Pond, Ithaca, New York, on July 20 contained two naked birds, just hatched, and two eggs. On the next day a third egg had hatched. The fourth egg was removed and its contents examined. Incubation was almost complete. The next day the nest was empty. Probably the young birds had been destroyed by a weasel, since an animal resembling a weasel in size and behavior had been seen in the field near the nest. The other nest in which the young birds were observed for five days, although four feet from the ground, was destroyed, probably by a cat which had been seen near the nest.

Economic Importance.—The Song Sparrow is of considerable economic importance both in its relation to man's interest, and in its relation to nature. During the nesting season I have seen the parent birds eating, and feeding the young, chiefly insect food. They eat many grasshoppers, their stout mandibles being well adapted for killing them. I have watched them bringing numerous caterpillars, butterflies, and beetles. During the rest of the year I have observed them eating weed seeds chiefly, occasionally berries and wild, small fruits.

From a purely practical point of view, therefore, the Song Sparrow is directly associated with the welfare of mankind, as a

destroyer literally of tons of weed seeds, thus reducing next year's crop of worse than useless plants, and as a destroyer of a number of harmful insects. In addition to this, the esthetic value of the bird is great. Its beautiful song and cheerful disposition are important contributions, and add much to our happiness.

Mt. Airy, Philadelphia, Pa.

ON VIREO CHIVI AND ITS ALLIES.

BY W. E. CLYDE TODD.

THREE species of Vireos from North and Middle America, *Vireo calidris*, *V. olivaceus*, and *V. flavoviridis*, regularly reach the southern continent as winter residents. South America is also the permanent home of another species belonging to the same group, *V. chivi*. It was first made known from Paraguay by Azara in 1805, and formally named *Sylvia chivi* by Vieillot in 1817.[1] A few years later it was redescribed as *Lanius agilis* by Lichtenstein,[2] on the basis of specimens received from Bahia, Brazil. After trinomials came into vogue Lichtenstein's name was revived to apply to the form found in the northern part of South America, until it was shown by Dr. Hellmayr[3] to be a pure synonym of *chivi*, and therefore inapplicable. This northern form was finally given the subspecific name *vividior* by the same author,[4] with Trinidad as the type locality. Meanwhile Dr. Chapman had applied the name *caucæ* to the race which he had found in western Colombia.[5] *Vireo roraimæ* Chubb was based on specimens from British Guiana.[6] In 1924 the present writer[7] discriminated a race from French Guiana under the name *griseola*. This completes the taxonomic history of the species to date.

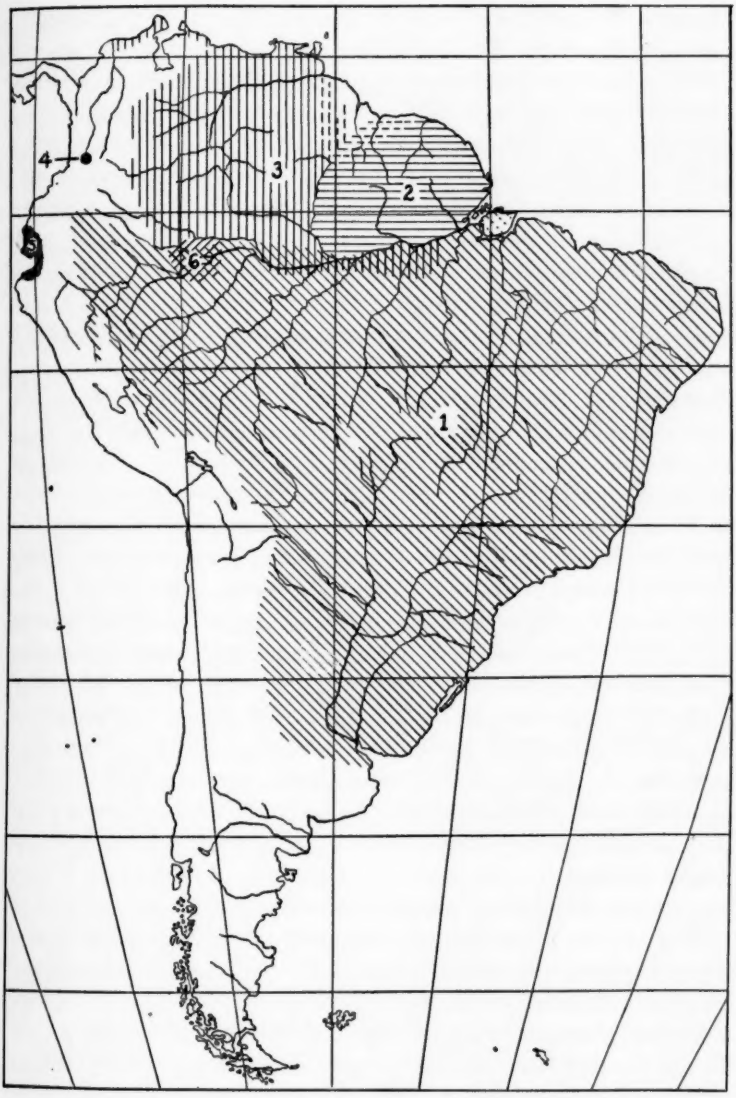
Typical *V. chivi* is in coloration close to *V. olivaceus*, but is smaller, with a shorter wing-tip and more rounded wing, the sixth, seventh, and eighth primaries being subequal and longest, while in *olivaceus* the sixth is always decidedly shorter than the other two. In worn plumage the under tail-coverts are as pale as in *olivaceus*, but in fresh dress they are brighter yellow, but not so bright as in *vividior*. The superciliaries and sides of the head are distinctly tinged with buffy—a character which is wanting in *vividior*, and is not noticeable in *olivaceus*. To make *olivaceus* and *chivi* conspecific,

[1] Nouveau Dictionnaire d'Histoire Naturelle, XI, 1817, 174.
[2] Verzeichniss Doubletten Zoölogischen Museums Berlin, 1823, 49.
[3] Novitates Zoölogicæ, XIII, 1906, 11.
[4] Verhandlungen Ornithologischen Gesellschaft in Bayern, XI, 1913, 315.
[5] Bulletin American Museum of Natural History, XXXI, 1912, 159.
[6] Birds of British Guiana, II, 1921, 393.
[7] Proceedings Biological Society of Washington, XXXVII, 1924, 124.

as lately proposed by Mr. Zimmer,[1] is so absolutely opposed to the conceptions of most American ornithologists with regard to species and races that I fail to see how it can be seriously entertained. If these two forms be united under a single specific head, then the process of amalgamation cannot stop there. Among the Vireos the difference between species is often slight, so far as distinctive characters are concerned. As I shall show in this very connection, the case of *Vireo chivi* constitutes a striking example of the difficulties which advocates of the "formenkreis" theory are apt to encounter in treating all representative forms as subspecies (compare my remarks in the Proceedings of the Biological Society of Washington, XXXV, 1922, 20).

The species in question has a wide range, from the Amazon River and eastern Ecuador on the north to Uruguay and the Province of Buenos Aires on the south, and from the eastern foothills of the Andes to the Atlantic coast in Brazil. It is subject to considerable variation in size, as indicated by Ridgway,[2] and more recently by Dr. Hellmayr.[3] But whereas the smallest specimens examined by the former author came from the southern part of the range of the species, our largest specimen (53,192, Embarcación, Argentina) comes from the same part, (wing, 75; tail, 55). There is so much variation in size, indeed, in specimens from the same geographic area that I fail to see how any subdivision of the species can be made on that ground. Our series of 42 skins (mainly from Bolivia and Brazil) certainly cannot be divided into two on any ground whatever. But now comes Dr. Hellmayr,[4] who believes that after all *agilis* can be maintained in a subspecific sense for the bird of eastern Brazil, on the basis of a difference in color. In the collection of the American Museum of Natural History there are a series of six freshly collected skins of this Vireo from Bahia, the type locality of *agilis*. These are not satisfactorily distinguishable from Bolivian skins, so far as I can see. Nor am I able to distinguish the east Brazilian specimens on which Dr. Hellmayr's remarks were based from our Bolivian series by any constant characters. Con-

[1] Field Museum Natural History Zoölogical Series, XVII, 1930, 413.
[2] Bulletin United States National Museum, No. 50, III, 1904, 132–3.
[3] Field Museum of Natural History Zoölogical Series, XII, 1929, 261.
[4] l. c., p. 260.



DISTRIBUTION OF VIREO CHIVI AND ITS ALLIES.

1. *Vireo chivi*
2. *Vireo caucæ griseolus*
3. *Vireo caucæ vividior*
4. *Vireo caucæ caucæ*
5. *Vireo caucæ*, subsp.
6. *Vireo caucæ solimoënsis*

sequently I am still of the opinion that a good case for the recognition of *agilis* has not been made out.

Coming now to the northern representative of the group, *vividior* we find it easily told from *chivi* by its obviously brighter coloration. The upper parts, including the wings and tail externally, are clearer, purer green (warbler green); the pileum is clearer gray, more strongly contrasted with the back; the superciliaries are whitish, not buffy, nor are the chin, auriculars, and throat buffy-tinged; and the under tail-coverts and inner margins of the rectrices are brighter yellow (barium yellow to Martius yellow). Ten males (from Trinidad, northern Venezuela, and the Santa Marta region of Colombia) average: wing, 73; tail, 51; bill, 14; tarsus, 17. Ten females: wing, 68.5; tail, 47; bill, 13.5; tarsus, 17. The differences between this form and *chivi*, although slight, are constant, and usually obvious even in worn plumage.

The range of this form, which has been supposed to be confined to Trinidad (and Tobago), Venezuela, and northern Colombia, is really much more extensive. It reaches and even passes the Amazon River, where it meets and overlaps the range of *V. chivi* itself, both forms having actually been taken together at Manacapurú and localities on the Rio Tapajóz, as shown by specimens in the collection of the Carnegie Museum. The possibility that such might be winter migrants from farther north at once suggested itself, but the dates of collection lend no support to such a view, any more than in the case of *V. chivi*. Hence there can be no further question as to *chivi* and *vividior* being two distinct species, since they occur together without mixing wherever their respective ranges overlap.

A curious thing about these trans-Amazonian representatives of *vividior* is that while they are absolutely identical with examples from the north coast of Venezuela, the birds from the opposite (north) bank (Obidos) belong to a different race, *griseolus*, characterized by the well-marked grayish suffusion of the under parts. This is the race that inhabits French Guiana, and probably ranges west to the Rio Negro. A series from Manacapurú, on the north bank of the Amazon, just west of the mouth of the Rio Negro, are *vividior*, but show some grayish suffusion below, and evidently tend toward *griseolus*. The birds from the upper Amazon, on the other hand, are different again, and are discussed beyond.

In western Colombia lives still another form, *caucæ*, characterized by its generally darker and duller coloration as compared with *vividior*. It is known at present only from the Cauca Valley, where it is isolated from any other form of this particular group. Its relationships are clearly with *vividior* rather than with *chivi*, and since the publication of its name antedates that of the former this whole group of conspecies will take *caucæ* for their specific appelation.

I have been able to examine a number of specimens of this Vireo from western Ecuador in the collection of the American Museum of Natural History. They come from the series placed by Dr. Chapman[1] under *griseobarbatus* von Berlepsch and Taczanowski, described from Chimbo, Ecuador. They may possibly average a little bit whiter, less grayish-tinged below, than our series of *vividior*, but the difference is certainly slight. Aside from this, I can find no characters whatever wherewith to separate them from *vividior*. Dr. Chapman, it is true, speaks of the greater extent of the greenish yellow below, and the smaller bill, but I cannot verify either of these characters. The main difficulty in such a reference lies in the discontinuous distribution thereby involved, since *caucæ* intervenes between the range of the Ecuador bird and that occupied by *vividior* in northern Colombia, while the Andes of course cut it off on the east.

It will be observed that Messrs. Lönnberg and Rendahl[2] have also identified their specimens from Gualea, Ecuador, as *vividior*. Dr. Chapman seems to have referred his series to *griseobarbatus* on geographical grounds. A careful reading of the original description of the latter leaves one with the impression that it must be a very different bird, since it is compared with *V. calidris* as well as with *V. chivi*. Unfortunately no measurements are given, but Dr. Hellmayr writes that it has in fact nothing to do with the *chivi* group. It is just possible that with a good series of first-class skins from western Ecuador available they might be discriminated from *vividior*.

There remain to be considered a series of thirteen specimens from the upper Amazon of Brazil, São Paulo de Olivença and Tonantins.

[1] Bulletin American Museum of Natural History, LV, 1926, 587.
[2] Arkiv för Zoölogi, XIV, No. 25, 1922, 77.

(From the latter locality, by the way, we have also a perfectly typical example of *V. chivi.*) These do not differ from *V. caucæ vividior* in color, but only in their smaller size. While on general principles I am averse to admitting subspecies to recognition when such are based solely on *slight* average differences in size, here is a case which seems to come within the requirements. Seven males of the new form measure as follows: wing, 62–67 (average, 64.5); tail, 41–45 (44); bill, 11.5–12 (12); tarsus, 15.5–17 (16.5). Five females: wing, 60–65 (62.5); tail, 41–45 (42); bill, 11–12 (11.7); tarsus, 14.5–16.5 (16). These birds are so much and so uniformly smaller than typical *vividior* (see measurements, *antea*) that they surely deserve subspecific separation, and I propose to call them

Vireo caucæ solimoënsis, subsp. nov.

Type, No. 96,399, Collection Carnegie Museum, adult male; São Paulo de Olivença, Rio Solimoës, Brazil, April 12, 1923; Samuel M. Klages.

Characters.—Similar in coloration to *Vireo caucæ viridior*, but uniformly smaller (See measurements above).

The forms treated in the present paper should thus be arranged as follows:

Vireo chivi (Vieillot). Brazil, from the Amazon Valley to Argentina and Uruguay, and west to the Andes.

Vireo caucæ griseolus (Todd). French Guiana to the Rio Negro, Brazil.

Vireo caucæ vividior Hellmayr. Colombia and Venezuela, south to the Amazon Valley.

Vireo caucæ caucæ (Chapman). Western Colombia (Cauca Valley).

Vireo caucæ subsp. Western Ecuador.

Vireo caucæ solimoënsis Todd. Upper Amazon, Brazil.

The present paper is based on the series of specimens of these forms in the Carnegie Museum, consisting of 179 skins, supplemented by material supplied through the courtesy of the American and Field Museums, to the authorities of which thanks are again returned.

Carnegie Museum, Pittsburgh, Pa.

GENERAL NOTES.

The Fishing Plunge of the Brown Pelican.—While engaged in an investigation of the muskrat in the coastal region of Louisiana during the years 1925–1927, I had many opportunities of observing the fishing plunge of the Brown Pelican (*Pelecanus occidentalis occidentalis*). Many writers have mentioned these plunges but very few analytical descriptions have been published.

Nichols (1918) described the observations of Dr. Russell J. Coles who noted the plunges of the Brown Pelican in Florida as follows: "When these birds are feeding, the distance of their flight above the surface of the water is carefully regulated by the depth at which the fish are swimming . . . I have often seen a Brown Pelican suddenly dart forward and upward ten to fifteen feet higher and circle back over his prey before making his plunge, indicating that the fish was swimming at a greater depth than expected." From this one may get the impression that the circle before the plunge occurs only when the Pelican has underestimated the depth of its prey. Quoting further, "The plunge is interesting in that it is always made headed *down wind*" (italics mine). From this point on until the bird strikes the water, the plunge is very accurately described. Nichols continues, "It is necessary for such a heavy bird to rise against the wind, therefore, it is only a case of instinctive preparedness that the Brown Pelican always rises to the surface headed up-wind, in order to be ready for instant flight."

Bent (1922) who quotes these notes of Nichols, comments on this description as follows: "Thus, by entering the water down-wind and emerging from it up-wind, the Pelican makes a complete turnover or turnabout under water; many writers have referred to this, and almost every observer has noticed it."

My observations are somewhat at variance with the preceding notes, for I have never seen the Brown Pelican plunge into the water headed down-wind or make a turnover or turnabout under water. The ordinary flight of the Pelican is into the wind whenever any breeze is blowing. When about to plunge, the bird makes a complete circle of 180 degrees so that it strikes the water headed up-wind. Upon coming to the surface of the water with its prey, the Pelican is still headed up-wind. Thus, it is in position to receive the wind on the under surfaces of its wings and so rise from the water to continue its flight. This, with the characteristic circling, is the normal plunge of the Brown Pelican as I have observed it in Lousiana.—ARTHUR SVIHLA, *State College, Pullman, Wash.*

Occurrence of the Barrow's Golden-eye and (Greater?) Snow Geese in Berkshire County, Massachusetts.—Late in the afternoon of April 15, 1931, I was driving on the dirt road bordering the Housatonic River, in Lenox, accompanied by John F. Treadway, of Williamstown. We skirted the rather spacious stretch of water back of the Lenox depot,

when the sight of a Duck within 150 feet of the shore attracted our attention. To our amazement the bird proved to be a drake Barrow's Golden-eye (*Clangula islandica*). Previous acquaintance with this species on the north shore of Boston enabled me to identify the bird readily, and to appreciate the rarity of its occurrence. Only once before, according to Mr. Forbush (Birds of Massachusetts, etc.) has this Golden-eye been recorded from the interior of Massachusetts.

To my present knowledge, there exist no Snow Geese records for this section of the state. The following observation, which was also shared by J. F. Treadway, took place at 10.10 A.M. on April 13, 1931, at the Pleasant Valley Bird and Wild Flower Sanctuary in Lenox. We were favored with exceptionally fine weather conditions. Far to the south a medley of shrill Geese honks broke the stillness of the morning, when presently, high overhead, appeared two long, loose lines of snow-white birds, with black wing-tips showing plainly as they sped straight northwards across the pale blue of the sun-washed sky. At least 300 birds composed this wonderfully impressive picture.

Of course there is doubt left as to their exact identity, but those who are familiar with the distribution and migration routes of both the Lesser and Greater Snow Geese would suppose that in all probability these birds were the Greater (*Chen hyperboreus nivalis*).—Maurice Broun, *Lenox, Mass.*

Total Albinism in the Mallard (Anas platyrhynchos).—Through the kindness of Mr. Clarence E. Chapman of New York, the owner of Mulberry Plantation, Berkeley County, S. C., the writer is able to record an instance of total albinism in a male specimen of *Anas platyrhynchos*. The Duck was presented to the undersigned by Mr. Chapman and is a beautiful example, being in perfect condition, fat and healthy. The color of the eyes was somewhat at variance with the few total albino birds seen by the writer in the past, having a rather deep reddish hue instead of pink. Every feather on the bird, however, was snowy white not a tinge of color being present. The feet and legs are of the same color as those of a bird in normal plumage.

One other totally albinistic Mallard was taken during the past open season on the Cooper River, Berkeley County, S. C. by Mr. G. D. B. Bonbright of Pimlico Plantation. An albino Black Duck (*Anas rubripes tristis*) was reported to the writer by Mr. Adolph Nimitz of Charleston, S. C., who saw the bird in company with other Black Ducks on the upper Cooper River, S. C., but failed to secure it.

It seems strange that three totally albinistic Ducks should occur in a rather restricted locality, all within a month or so of each other, when so many years pass without one being seen.—Alexander Sprunt, Jr., *92 South Battery, Charleston, S. C.*

Cinnamon Teal in Michigan.—A Correction—The bird referred to in 'The Auk,' 1931, p. 109, has been examined by Dr. H. C. Oberholser

who identifies it as a Blue-winged Teal much stained by iron. I hasten to correct my error which I regret exceedingly.—W. Bryant Tyrrell, *Bloomfield Hills, Mich.*

Blue Goose (Chen caerulescens) in Pennsylvania.—A Blue Goose was killed on the Susquehanna River, a few miles above Harrisburg on November 10, 1930, by William N. Minnick of this city. It was an adult female and weighed four pounds three ounces when presented to the Pennsylvania State Museum, November 12. We have it mounted and will place it on exhibition in a short time.—Boyd P. Rothrock, *Curator, Pennsylvania State Museum, Harrisburg, Pa.*

The Golden Plover (Pluvialis d. dominica) on the Coast of South Carolina.—Since Mr. Arthur T. Wayne secured but five specimens of *Pluvialis d. dominica* during his nearly fifty years of field work in coastal South Carolina, the fact that it is a *rara avis* locally is quite obvious.

The writer has looked for the species for many years about Charleston but it was not until April 4, 1931 that the first one was seen here. On that day, in company with Messrs, E. A. Williams of Charleston and Walden Pell, of Middletown, Delaware, the writer was investigating a large tract of sand and marsh near one of the barrier islands about ten miles south of Charleston. This tract, known as Sol Legare Island, is an admirable resting and feeding place for shore-birds both migratory and resident. While watching several Willets (*Catoptrophorus s. semipalmatus*) our attention was attracted by a Plover nearby which was feeding in short grass. Focussing 8x glasses on it, I noticed at once that it differed from *Squatarola*. It was surprisingly tame, allowing steady approach to within fifty or sixty feet and we studied it from every angle and at complete leisure as it alternately fed and watched us. The pale brownish wash on the plumage was very distinct, it seemed smaller and trimmer in appearance than *Squatarola*, and after thoroughly satisfied as to its identity, we walked forward and flushed it purposely. As the bird rose any doubt which may have existed vanished at once. There was not the slightest trace of black under the wings; the call was markedly at variance from *Squatarola;* the flight swifter and the conspicuous white rump absent.

Mr. Pell, who is familiar with the species about the New York City region and in New England agreed to the identification without hesitation when the bird took flight. It is of interest to note that this Plover was found on the shores of the same little pond in which Messrs. Herbert R. Sass, Ellison A. Williams and the writer saw the Black-necked Stilt (*Himantopus mexicanus*) and the Wilson Phalarope (*Steganopus tricolor*) on May 11, 1929 (Auk, Vol. XLVI, 383). In this note Mr. Sass, who wrote the item, makes no distinction between James and Sol Legare Island, but it was on the latter that the birds were seen.

The day following the above observation was very bad but a trip was made to the spot the next afternoon in hopes of securing the specimen. A

critical search, however, failed to reveal its presence. This is the third rare Shore-bird of South Carolina to be seen in this small area.

On the afternoon of April 23, in company with Mr. Edward S. Dingle, I saw two more birds of this species on Sol Legare Island. Though we maneuvered for a shot, we were unsuccessful in obtaining one but returned early the following morning (the 24th) and found the two Plover in the same spot, and as they rose I secured one. It is a male in the moult, the golden spangles just appearing on the back and a few black feathers showing on the belly. These two Plover were about one mile from the spot where the first was seen on April 4, in the same character of ground, short grass and sand. The bird I shot was thin and the throat and breast feathers considerably worn.—ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Golden Plover in the Lake Winnebago Area.—Due to the severe drought of 1930 the level of Lake Winnebago, Wisconsin, was considerably below normal. Broad mud and sand bars extended far into the water and offered special attraction to multitudes of shore birds, which for the most part, passed up this area during years of an abrupt shore line. Particularly abundant were the Golden Plover, which under normal conditions could be considered very uncommon.

This decided increase in number was first noticed by the writer on September 26, 1930, when flocks of from ten to one hundred were observed to pass up and down the shore. In about one hour no less than about five hundred of them passed before us. Some of these larger flocks were literally shot to pieces by pot hunters who raked them with gun fire as they settled on the mud bars in the vicinity of duck blinds. Without authority to arrest, protests to the offenders were of no avail and the butchering continued. Of six specimens collected, one was in the mottled plumage. During our stay one flock of Black-bellied Plover was noted.

On October 17 I again visited the locality and noted that the Golden Plover were far less numerous than earlier. Hunters reported that many hundreds of the birds had been killed.

The situation becomes alarming in states where there is no restriction on the killing of Plover, particularly so where those species whose numbers are admittedly on the decline and which are easily shot are driven to concentration on favorite duck hunting grounds.[1]—OWEN J. GROMME, *Milwaukee Public Museum, Wis.*

Golden Plover in Delaware—A Correction.—In 'The Auk' for Jan. 1930, p. 80, Mr. R. O. Bender recorded Golden Plover at Kittshammock, Delaware, and mentions the *presence* of black axillaries in their identification, owing to an unfortunate error in typing the manuscript. The sentence should read *absence* of black axillaries.—EDITOR.

[1] We were under the impression that the Migratory Bird Treaty Act and enforcement regulations, under which these birds are protected at all times superseded any State laws. What is the Federal Warden doing in this region?—Ed.

A Note on Nesting Killdeers.—On the morning of April 19, 1931, Robert Montgomery and I found a set of Killdeer's eggs consisting of four, as usual, one of which was not turned with the pointed end down. The eggs were located among some small chips of limestone, but there were only a few more chips lining the depression than were scattered about the vicinity of the nest. Seven hours later the nest was revisited, and much to our surprise the nest was not only completely lined, but the eggs were resting on a bed of the limestone chips covering the ground from view.

The next day two more Killdeer's nests were found while I was accompanying the University of Minnesota ornithology class on a field trip. One of them, to the surprise and interest of all the observers, was composed of shot gun wads, and was surrounded by several hundred old shot gun shells. This nest was apparently finished, but the other one found was only slightly lined with coarse grasses and the wings of boxelder seeds; so on the next possible occasion, which was two days later, I revisited this latter nest, and found it had been added to considerably, though there was not as much difference in the amount of nesting material as in the case cited first.

A previous observation leads me to suspect that it might be a common occurrence for Killdeers to lay their eggs before completing the nest. On April 27, 1930 I found a single Killdeer's egg lying among some dry leaves without the slightest suggestion of a depression or a nest. The assumption is, of course, that the birds would have laid the rest of the eggs in the same spot and built a nest around them.—ALDEN RISSER, *St. Paul, Minn.*

Wilson's Phalarope and Red-backed Sandpiper at Battle Creek, Michigan.—On May 10, 1931 while studying shore-birds along the Kalamazoo River, I came upon a female Wilson's Phalarope (*Steganopus tricolor*). She was feeding with a flock of Lesser Yellowlegs on one of the numerous mud flats above the Consumer's Dam. I rented a boat and was able to row within twenty feet of the bird before she flew. The markings of the female on the head, neck and throat are so outstanding at such close range that the bird was easily identified. Even at a distance she stood out clearly from the other shore-birds.

As I approached the Phalarope I was surprised to see three Red-backed Sandpipers (*Pelidna alpina sakhalina*). This is another uncommon, even rare, shore-bird in this part of the state. Since the birds allowed an approach of fifteen feet without flying the red back and the black band on the belly were easily noted.—LAWRENCE H. WALKINSHAW, *Battle Creek, Michigan.*

The Stilt Sandpiper (Micropalama himantopus) near Charleston, S. C.—It is with pleasure that the writer is able to record the capture of the second specimen of *Micropalama himantopus* in South Carolina since the time of Audubon. The bird was seen in a small pond on Sol Legare Island, Charleston County, S. C., April 17, 1931 and was feeding in company with some Yellow-legs (*Totanus flavipes*). On examining the birds

in the pond through my glasses, my attention was arrested by this individual and I remarked to Messrs. Edward S. Dingle and Peter Gething who were with me, that it appeared to differ from the Yellow-legs in a somewhat indefinite way. After looking at it, they agreed with me but neither of us recognized the species for what it was. I had never seen *M. himantopus* previously, nor had they, and the resemblance to *T. flavipes* was very marked under the existing light and conditions. At any rate, its strangeness resulted in the bird being taken and it proved to be a female Stilt Sandpiper in winter plumage.

This is the first specimen of the species to be taken in this state for nearly nineteen years, one having been secured on Pawley's Island, near Georgetown, on August 22, 1912 by Mr. C. P. Webber, his bird being the first taken since Dr. Bachman secured specimens while working with Audubon.—ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Pectoral Sandpiper at Lexington, Virginia.—On April 3, 1931, the writer, in company with Prof. R. S. Freer, of Lynchburg, Va., and Mr. M. G. Lewis, of Lexington, Va., discovered five Pectoral Sandpipers (*Pisobia maculata*) feeding in a small muddy flat near Lexington. They were within twenty yards of the much-travelled Lee Highway. One of the birds, which already had a broken wing, was taken by me and a skin made of it. I saw three at the same place on April 5 and again on April 8. The Pectoral Sandpiper was formerly reported by Dr. E. A. Smyth to be a fairly regular spring migrant in Montgomery County, but this is my first record here in four years of fairly regular field work.—J. J. MURRAY, *Lexington, Va.*

The Long-billed Curlew at Belvedere, Alberta.—On May 26, 1930, during a violent squall of wind and rain I observed six rather large birds fly in from the lake and alight in the stubble of a wheat field, on my place at Lac La Nonne.

They were unknown to me and I immediately secured my gun and glasses and went after them to obtain a specimen. However, they were wary and I was unable to get within range, but I had several good views of them through my glasses and had no difficulty in identifying them as Long-billed Curlews (*Numenius americanus*). They remained on the stubble during the afternoon but I did not molest them further after satisfying myself as to their identity. On the 28th one of these birds or another straggler was still on one of my fields. On May 20 and 21 we had a violent snowstorm and possibly this caused these birds to become confused and lost.

I believe this observation extends the known range of the Long-billed Curlew in Alberta considerably to the northward.—A. D. HENDERSON, *Belvedere, Alberta.*

The Shore-bird Flight of 1930 on the New Jersey Coast.—The appended compilation of shore-bird records from the coastal regions of New Jersey during 1930 follows the same plan as those of 1928 and 1929, previously published in 'The Auk.' It is from the records of the writer,

Warren F. Eaton, Oscar T. Eayre, James Leland Edwards, Julian K. Potter, Lester L. Walsh, and various other members of the Linnaean Society of New York and the Delaware Valley Ornithological Club.

The localities covered were about the same as those of the two preceding years. The trips during the southward migration, from July to January, were apportioned as follows: Newark Meadows, 39; Troy Meadows (20 miles inland), 3; Point Pleasant, 12; Barnegat Inlet, 16; Barnegat Marshes (west of Bay), 12; Beach Haven Inlet, 12; Grassy Bay, 1; Brigantine and Absecon Marshes, 18; Coast between Atlantic City and Cape May, 4; Cape May, 7; total, 124. The distribution of the trips by months was: July, 30; August, 41; September, 21; October, 10; November, 10; December, 9; January, 3.

TABLE I.—RANKING OF SHORE-BIRDS ON NEW JERSEY COAST AND SALT MARSHES IN 1930. FALL FLIGHT.

(*Figures in ( ) directly following name indicate rank in 1928 and in 1929*).

	Rank 1930	Times seen	Largest No. in 1 day	Total No. all trips
Semipalmated Sandpiper (1), (1)	1	59	3,000	20,813
Semipalmated Plover (4), (2)	2	54	1,200	7,115
Lesser Y llow-legs (3), (3)	3	49	350	2,593
Sanderling (2), (5)	4	41	600	5,644
Dowitcher (7), (4)	5	27	600	3,149
Black-bellied Plover (6), (14)	6	47	200	1,216
Killdeer (9), (8)	7	55	65	555
Hudsonian Curlew (11), (6)	8	20	500	1,942
Least Sandpiper (5), (7)	9	42	100	474
Knot (13), (10)	10	24	170	590
Spotted Sandpiper (15), (15)	11	46	62	439
Pectoral Sandpiper (14), (16)	12	31	60	219
Golden Plover (16), (20)	13	12	150	439
Turnstone (12), (12)	14	24	30	268
Red-backed Sandpiper (10), (11)	15	14	100	236
Greater Yellow-legs (8), (9)	16	43	10	132
Piping Plover (18), (18)	17	24	30	215
Stilt Sandpiper (22), (22)	18	15	40	127
Western Sandpiper (23), (17)	19	16	30	102
Upland Plover (20), (21)	20	20	21	102
White-rumped Sandpiper (19), (13)	21	16	12	49
Wilson's Snipe (24), (27)	22	4	6	13
Willet, (17), (19)	23	7	3	10
Solitary Sandpiper (30), (26)	24	4	1	4
Wilson's Phalarope*	25	2	2	4
Woodcock*	26	3	1	3

* Not recorded in 1928 and 1929 from area covered.

In both Table I and Table II the species are ranked by taking an average of (1) their ranking in "number of times seen"; (2) their ranking in "largest number seen in one day" and (3) their ranking in "total numbers seen on all trips." This method was used in 1928 and 1929.

The summer of 1930 was even drier than that of 1929 and on Newark Meadows a cessation of filling operations and more careful draining of the old fill and marsh made the locality less inviting for shore-birds. This, coupled with an increasing use of the neighborhood by airplanes, affected the total counts of a number of species, especially Semipalmated Sandpiper and Lesser Yellow-legs. During 1930 but 26 species were recorded, compared with 28 in 1929 and 31 in 1928. The only rarity was Wilson's Phalarope, found in two locations. There were definite increases in Stilt Sandpiper, Upland Plover, Black-bellied Plover and Golden Plover, and decreases in several species apparently due to other causes than dry weather. Of these we would mention Least Sandpiper, Red-backed Sandpiper, White-rumped Sandpiper, Greater Yellow-legs and Willet. The five leading species in 1930 were the same as those of 1929 with only one shift in position.

On Newark Meadows, because of drought and dry ponds, the Lesser Yellow-legs, for the first time in my experience, took to the uncut salt marsh where they associated with Upland Plover and foraged for insects (grasshoppers were abundant) even into the edges of the beds of tall Phragmytes. It was a strange sight to see these birds flush from dense cover.

The main northern flights of several species seemed later than in 1929 and the southern flight also was probably a bit later. As late as May 31 on Newark Meadows there were eleven species of shore-birds, including over 5,000 individuals and on June 22 at Barnegat Inlet 16 species. Since but nine species were recorded there July 6 it is probable that many of the late June birds were late northern migrants. The Red-backed Sandpipers present in late June, as an example, were in full breeding plumage and evidently bound north.

Extreme dates on the fall migration and distribution of the principal species follow:

Steganopus tricolor. WILSON'S PHALAROPE.—Aug. 10 and Sept. 1.

Limnodromus griseus griseus. DOWITCHER.—July 6 or earlier to Sept. 14. Flat sandy inlets and coastal marshes; largest numbers on Brigantine.

Micropalama himantopus. STILT SANDPIPER.—July 6 to Sept. 21, chiefly July 26 to Aug. 10. Coastal ponds; most on Brigantine.

Calidris canutus. KNOT.—July 6 to Sept. 14, chiefly July 19 to Aug. 10 and principally July 26. Majority on beaches from Barnegat Inlet to Brigantine.

Pisobia maculata. PECTORAL SANDPIPER.—July 19 to Oct. 12. Majority on tidal marshes of Newark and Barnegat.

Pisobia fuscicollis. WHITE-RUMPED SANDPIPER.—July 16 to Oct. 12. Scattering, no concentration.

Pisobia minutilla. LEAST SANDPIPER.—July 6 to Oct. 12. Majority on wet marshes of Newark and Brigantine.

Pelidna alpina sakhalina. RED-BACKED SANDPIPER.—Aug. 24 to Nov. 16. Mostly on ocean inlets.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—July 6 to Oct. 12. About 70% on mud flats of Newark Bay; remainder chiefly on sand flats, Barnegat Inlet.

Ereunetes mauri. WESTERN SANDPIPER.—July 16 to Oct. 12. Mostly just inside coastal strips.

Crocethia alba. SANDERLING.—July 16 through winter. Beaches. Largest concentration, Seaside Park to Barnegat Inlet.

Totanus melanoleucus. GREATER YELLOW-LEGS.—July 19 to Oct. 12. Chiefly salt marshes, but scattering.

Totanus flavipes. LESSER YELLOW-LEGS.—July 6 to Oct. 5; maximum Aug. 16. Newark Meadows 74% of total; some concentration on Brigantine and Barnegat Marshes.

Catoptrophorus semipalmatus (Subsp.?). WILLET.—July 6 to Sept. 7. Chiefly coastal. Birds seen early in summer were migrating south along ocean.

Bartramia longicauda. UPLAND PLOVER.—July 25 to Sept. 13; maximum Aug. 16. Newark Meadows 97% of total seen.

Actitis macularia. SPOTTED SANDPIPER.—Breeds and to remains until Sept. 21. First south-bound flocks July 6. Largest concentration, early August, on Newark Meadows.

Numenius hudsonicus. HUDSONIAN CURLEW.—June 22 to Sept. 14. Principal migration route over Barnegat Bay. Most of the birds feeding were about Absecon and Sea Isle City.

Squatarola squatarola. BLACK-BELLIED PLOVER.—July 12 to Nov. 15. Migration chiefly coastal.

Pluvialis dominica dominica. GOLDEN PLOVER.—Aug. 17 to Oct. 5; Main flight Sept. 21–28. All records from Newark Marshes.

Oxyechus vociferus. KILLDEER.—Breeds and winters. Largest fall flocks Cape May.

Charadrius semipalmatus. SEMIPALMATED PLOVER.—July 12 to Oct. 12; maximum Aug. 17. Largest concentration Newark Bay flats (81%).

Charadrius melodus. PIPING PLOVER.—Breeds and remain until Sept. 14.

Arenaria interpres morinella. TURNSTONE.—July 12 to Sept. 14. Mostly coastal but very scattered.

The 36 trips taken during the spring migration included six to an interior Snipe meadow. We did not strike the main coastal flights as in 1929. Principal localities as in the fall migration.

The irregularity of spring ranking from year to year indicates the large influence of weather and chance on the numbers seen during the rapid flight north, more of which, I believe, is done at night than on the southern flight. In the spring bad weather drives more birds to rest on the marshes

and this determines the number of passing flocks that are seen by an observer at any given spot.

The writer has noted a definite increase in the numbers of Lesser Yellow-legs in New Jersey in spring as one goes inland from the Coast. The bird is rare along the coast in spring but less rare about the fresh water swamps in the interior of the state.

TABLE II.—RANKING OF SHORE-BIRDS ON JERSEY COAST AND SALT MARSHES IN 1930. SPRING FLIGHT.

(*Figures in ( ) directly following name indicate rank in 1929*).

	Rank 1930	Times seen	Largest No. in 1 day	Total No. all trips
Semipalmated Sandpiper (1)	1	10	3,500	5,300
Semipalmated Plover (6)†	2	10	1,500	1,953
Greater Yellow-legs (3)	3	15	100	314
Black-bellied Plover (7)	4	7	300	583
Least Sandpiper (9)	5	8	100	380
Dowitcher (2)	6	8	100	312
Wilson's Snipe (14)*	7	8	50	123
Turnstone (5)	8	5	150	214
Killdeer (10)	9	17	9	44
Spotted Sandpiper (13)	10	12	10	37
Red-backed Sandpiper (4)	11	6	50	100
Sanderling (12)	12	5	50	136
Knot (7)	13	6	12	47
Hudsonian Curlew (15)	14	5	50	85
Piping Plover (16)	15	6	8	22
Woodcock	16	8	2	10
White-rumped Sandpiper (11)	17	5	5	12
Solitary Sandpiper (18)	18	2	5	6
Lesser Yellow-legs (19)	19	2	4	8
Pectoral Sandpiper (20)	20	2	1	2
Western Sandpiper (17)	21	1	2	2

* 1929 did not include Troy Meadows.

† Omitted from table in 'The Auk,' Vol. XLVII, No. 3, p. 426.

—CHARLES A. URNER, *Elizabeth, N. J.*

American Egret and Little Blue Heron at Scarborough, Maine.—In 'The Auk' (Vol. XXXVIII and Vol. XXXIX, 1922) I recorded observations on the Egret in this locality, but up to 1930 no records had been made of the Little Blue Heron.

On August 31, 1930, Dr. W. P. Coues called my attention to one Egret and two Little Blue Herons, in the white plumage, which he had seen on the salt marsh. In a short time I found them feeding around a small tidal pond not far from the highway and watched them for an hour, when the

Egret flew to another location a few hundred yards away. For the next ten days I saw them frequently and a second Egret had joined them. At times they were separated, at other times feeding together, and on one occasion were in company with a Great Blue and a Black-crowned Night Heron.—RUTHVEN DEANE, *Chicago, Ill.*

Roseate Spoonbills in Florida.—Supplementing the reports made by Catharine A. Mitchell of Riverside, Illinois, and Dr. W. C. Herman, in the April 1931 "Auk" on the Roseate Spoonbills on the western coast of Florida, I would say that for some years I have made a number of trips over the territory covered by them.

The largest number of Roseate Spoonbills I have seen was along the Drainage Canal, about four miles east of East Cape, where, in the mangroves bordering the Canal, I counted a flock of forty. This was in January, 1929.

I then proceeded to the rookery situated about six miles northeast of the mouth of the Canal. There I found twelve nests which contained young. We succeeded in obtaining some fair colored movies of them. This rookery was located on the banks of a small lake with bayous running off. As far as we were able to judge, it had about five thousand nests of the Snowy and American Egret, White and Wood Ibis, Louisiana Blue Heron, Water Turkey and Bitterns (January, 1929).

I visited the rookery again about January 26, 1930 and found that the storm of the year preceding had done great damage to the trees. As before, there were a large number of new nests and the marshes leading to the rookery were white with the birds above mentioned. This time, there were only twenty-six of the Roseate Spoonbills along the side of the Canal and I did not find any around the rookery.

I again visited the rookery about January 25, 1931. There were only fourteen of the Spoonbills in evidence along the Canal. The other birds we observed were one flock of Wood Ibis and scattered specimens of Louisiana Heron on our trip up the Canal, as the marshes were absolutely dry. A careful examination of the rookery showed only fifty or sixty new nests and the only inhabitants that I saw were four White Egrets and a pair of what my guide called Brown Curlew. The trees of the rookery were practically all dead—the majority of them prostrate. After a careful examination, I could see no traces of any birds having been shot. I think they must have left the rookery on account of the lack of feeding grounds.

I observed with my field glasses a large number of Wood Ibis circling in the air near the south end of Whitewater Bay. I regretted that I did not have time to see whether the rookery had moved there. The only evidences of bird life, outside of the Louisiana Heron, were a number of the Greater and Lesser Yellow-legs, all the Ducks and Mud Hens having left.

I also observed that the big flock of Shearwaters which feed on the shoals between Sandy Key and the mainland were about the same in number as when I first observed them in 1927. The number of wading birds on the

shoals was considerably less than in previous years. The Wood Ibises on the tributaries in Shark River seemed to be as numerous as in March, 1926, at which time they had a large rookery there, extending more than three-quarters of a mile on both sides of the tributary. This rookery was shot out the following year and I had not observed the birds there in any great numbers until last January.

In former years, the Ibis had been shot in great numbers by the mackerel fishermen who congregate at the mouth of the Little Shark River and killed them for fresh meat. I think that since it has been patrolled, there is considerably less of this done than in former years.

On practically every trip I have made, I have seen scattered specimens of Spoonbills on the flats which border the Marco River, but have never seen any flocks.—EUGENE R. PIKE, *6 N. Michigan Avenue, Chicago, Ill.*

Another Nesting Record of the Goshawk for Massachusetts.—On April 19, 1931, a pair of Goshawks (*Astur atricapillus*) was found nesting in the township of Chester, Hampden County, constituting another breeding record, the second for our state. John A. Farley recorded the initial nest when he identified a pair with young in the Harvard Forest at Petersham, Worcester County, May 22, 1922. (See 'Wilson Bulletin' for Dec. 1922.) He found them nesting there the following year and on Apr. 28, 1923 collected the nest and 3 eggs, which are now in the Thayer Museum at Lancaster. The present nest was located by Arthur Woods who noticed a strange pair of Hawks acting in a manner that indicated nesting. Summoning his friend Albert A. Cross of Huntington both men investigated and discovered the birds to be Goshawks with a full set of four whitish eggs in the nest, that measured in inches as follows: 2.31 × 1.75; 2.25 × 1.75; 2.31 × 1.81; 2.37 × 1.68. Ever since Farley's discovery Mr. Cross has been of the opinion that at least one pair of Goshawks nested in the western hilly, wooded part of the county bordering Berkshire. One was shot in the early fall of 1928 at Otis near the State Forest and on April 10, 1930, an adult was brought to Mr. Cross, having been caught in a steel trap and not seriously injured. He liberated the bird after identifying and banding it. Unfortunately it flew through a window a few days later and was killed.

The nest is situated at a height of forty-four feet above ground in a rock maple, set in the midst of a group of hemlocks; it is a bulky affair, three by four feet across and nearly three feet in depth. Mr. Cross hopes to band the fledglings as they approach the time of leaving the nest.—AARON C. BAGG, *Holyoke, Mass.*

Snowy Owls in Southern Michigan.—During the winter of 1930–31 there has been an invasion of Snowy Owls (*Nyctea nyctea*) throughout southern Michigan. We have three definite records besides many others which we have not traced up. At Berrien Springs a Snowy Owl was seen

on the campus November 1, 1930, by Miss Mary E. Lamson. On November 4 this or another bird was captured at the same place by Roy Furgeson and was kept in captivity until February 3, 1931 when it was banded and released.

Another Owl was captured at Fisher Lake, near Three Rivers on December 18, 1930 by Frank Francisco who brought the bird to Battle Creek where it died January 1, 1931. This bird has since been mounted.

Another bird was seen near Ann Arbor by the first two observers on January 11, 1931. This bird was in an apple orchard somewhat distant from water, in the northern part of Washtenaw county.—RICHARD E. OLSEN, HUMPHREY A. OLSEN, and LAWRENCE H. WALKINSHAW, *Battle Creek, Mich.*

Short-eared Owl (Asio flammeus) in Virginia.—On January 28, 1930, I secured a Short-eared Owl (*Asio flammeus*), which had been wounded and caught at Markham, Virginia, approximately seventy miles west of Washington D. C. This species of Owl is a rare winter visitant in the District of Columbia.—JOHN ALEXANDER MOORE, *701 19th St. N. W., Washington D. C.*

Feeding of Horned Owl on Jerusalem Crickets.—A Pacific Great Horned Owl (*Bubo virginianus pacificus*) killed by a friend near Benicia, Solano County, California, and brought to me for my collection of skins, shows by the stomach contents that it had fed heavily on the Jerusalem Cricket (*Stenopelmatus*) during the previous night.

Among the softer contents of the stomach were 85 mandibles and 101 leg segments of these bulky insects which seem to be favorites with most of the Hawks and Owls. This number of segments would necessitate the destruction of no less than 43 Jerusalem Crickets, which, as found by comparing the size of these parts with specimens of the crickets, must have averaged an inch and three-quarters each in length measuring from front of head to tip of abdomen. Due to the destructive habits of these crickets, the result of this stomach examination is a point in favor of the economic value of the Horned Owl. The above insect diet composed the entire bill of fare of this bird with the exception of one tiny bone, probably from a small rodent.

I have preserved such of these stomach contents as could be dried in one of my glass-covered mounting boxes. Many items of stomach contents can be easily preserved and I find that they make an interesting and instructive exhibit.—EMERSON A. STONER, *Benicia, Calif.*

Decrease of Hawks and Owls in Northern New Jersey.—In reviewing my notes of the past six years covering field-trips in northern New Jersey I was tempted to check in detail the numbers of Hawks and Owls recorded alive throughout this period. By way of explanation the number of trips, i. e. of an average duration of several hours in the field is 271, none to the south of Atlantic City, distributed as to season about equally

monthly, with the exception of September, when I have been away on vacation. During the past two years the number of trips has been greater than before and the daily ride across the Hackensack meadows has added a great many records of Hawks which I included. By taking the number of individuals of a species and dividing by the number of field trips a quotient is obtained which can be used in comparing the years 1925–1927 with the years 1928–1930 to determine the relative decline or increase in the various species. In general the decrease has been in direct proportion to the size of the bird. The most important conclusion however, is that while most of the Buteos and larger species have shown a decrease, the more harmful of the Accipiters and Falcons have shown a gain in contrast. Our present method of educating (?) hunters and gamekeepers has resulted in diminishing the species that should be protected and in increasing relatively the more harmful ones which perhaps should be controlled. For the sake of simplicity I have shown certain of the comparative species together. Considering these as a whole the frequency (number of species per field trip) has fallen 25% and the number of individuals 33%.

Marsh and Rough-legged Hawks decrease 54%.

Buteos—Red-tail, Red-shoulder and Broad-wing decrease 34%.

Sparrow-hawk decrease 25%.

Cooper's, Sharp-shin, Pigeon and Duck Hawks gain 14%.

I believe it is correct to say that the winter of 1929–30 was a good one for many Hawks, especially on the Hackensack Meadows while the present winter has been just the reverse in this locality. Breeding Hawks and Owls, except the Sparrow Hawk and Screech Owl, have decreased even more than the trends indicate, for during migration large numbers of Red-tails, Marsh and Broad-winged Hawks are sometimes seen. I have made many special trips to visit the most desirable country including Overpeck, Hackensack, Newark and Elizabeth marshes, Troy meadows, Barnegat and the Watchung and Kittatinny mountains.

All species of Raptores (21 considered).

	Frequency	Number of individuals seen per trip
1925	3.2	10.1
1926	2.0	4.5
1927	1.8	5.9
1928	1.6	2.1
1929	1.2	2.1
1930	1.6	3.1

—Warren F. Eaton, *63 Normal Ave., Upper Montclair, N. J.*

The Yellow-bellied Sapaucker (Sphyrapicus varius varius) in Porto Rico.—On April 2, 1931, at Algarrobo, which is a flag-stop, about halfway between Vega Baja and Manatí, on the north coast, I saw a female Yellow-bellied Sapsucker. It was sitting on the rim of the bird

bath while I was standing on the screened porch, fifteen feet from the bath. The Sapsucker remained in the same position for several seconds, then flew to the trunk of a young sapling, two feet nearer the house, alighting low. It hitched up the slender trunk and there remained stationary a few seconds longer, so that I was able to identify it unmistakably.

It has been recorded from St. Croix, but I know of no record of it from Porto Rico.—NINA G. SPAULDING, *Vega Baja, Porto Rico.*

Notes on the Guacharo.—I have read with the greatest interest Mr. Carriker's graphic and accurate account of the Guacharo caverns of Trinidad, and their strange inhabitants—perhaps the weirdest of living birds.

May I, with a much slighter knowledge of the birds than Mr. Carriker possesses, point out that, in giving an average length of thirteen inches and a wing-spread of twenty-eight to thirty inches, he makes the Guacharo much too small?

The ordinary wing measurement, from the carpal joint to the tips of the primaries, runs to 12 or 12½ inches, and in the Guacharo the humerus and forearm are very long, giving the bird a very wide spread of wing, and an appearance of almost Kite-like size. I measured carefully the expanse of a female which I obtained in a cave near Arima (March 13, 1921), and found it to be exactly 40½ inches. The length measurement given is also too little. The tail alone measures between 8 and 9 inches, and the bird is long in the body.

One or two other points may be worth mentioning. In sitting birds of which I had a good view the tail was closed in the form of an inverted V, as in *Gallus*.

Young birds were seen to eject palm fruit seeds from the mouth.

A good observer told me that Guacharos, when feeding, do not settle, but hover up against the bunches of palm fruit, and wrench off the nuts with their hooked bills.—A. L. BUTLER, *St. Leonard's Park, Horsham, England.*

The Chimney Swift in Colorado.—One hesitates to report a sight record as the first occurrence of a species in a region, and yet conditions may be such as to produce a very high degree of certainty in a field identification. On May 16, 1930, I saw what I believe to have been the first Chimney Swift (*Chaetura pelagica*) to be seen within the state of Colorado. It was flying about near the Duck Pond in City Park at Denver, and in the air at the same time were four Cliff Swallows and two Rough-winged Swallows. I am familiar with the Northern Black Swift and the White-throated Swift, the only two Swifts which have heretofore been reported from Colorado, and for the last three summers I have studied birds in northern Illinois and Indiana so that the Chimney Swift was well known to me. For about ten minutes I watched the bird. The very short tail and very narrow bow-like wings, dark sooty color, and twitter were unmistakable, and the Cliff Swallows afforded a good opportunity to deter-

mine relative size. My notes say, "only a little larger than a Cliff Swallow." Florence Merriam Bailey gives the wing of the Cliff Swallow as 4.05–4.55, and the wing of the Chinmey Swift as 5.00–5.25, and the wing of the Black Swift as 6.50–7.50.

The Chimney Swift is said to be "common in Western Kansas" (Bailey, Handbook of Birds of the Western United States), and it is not improbable that its range is extending westward, as is true with other eastern species.—Thompson G. Marsh, *4705 E. 25th Ave., Denver, Colo.*

The Races of Hylophylax naevioides (Lafresnaye).—In his great work on the 'Birds of North and Middle America' (Bulletin United States National Museum No. 50, V, 1911, 128) Ridgway recognized but one form of this species, placing the supposed race *capnitis* in synonymy without comment. But Mr. Bangs is quite right, in my opinion, in insisting that the Costa Rican form of this species is distinct from that found in Panama and Colombia. His *Hypocnemis naevioides capnitis*, from Miravalles, Costa Rica, was described as new on the supposition that Lafresnaye's type of *naevioides* came from Pasto, Colombia. But neither in the original description nor on the label of the type-specimen is any locality mentioned. The type in question, which is preserved in the collection of the Academy of Natural Sciences of Philadelphia, where I examined and compared it a few years ago, agrees perfectly with the Costa Rican bird. Dr. Hellmayr (Field Museum of Natural History Zoological Series, XIII, part 3, 1924, 307) has fixed on Panama as the type-locality, in the belief that the type probably came from the same place as two specimens in the Derby Museum with that locality attached. But it may just as easily have come from Nicaragua, where Delattre collected also, and such a supposition would accord with the characters afforded by the specimen itself. In any case I do not see how we can assume a type-locality which would contradict these characters. I think therefore that *capnitis* should be regarded as a pure synonym of *naevioides*, which is the proper name for the dark northern race, while *subsimilis* (nobis) becomes the proper name for the southern bird.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh, Pa.*

Scissor-tailed Flycatcher, a rare Florida winter resident.—While at Key West, Monroe County, Florida, from November 11–28, 1930, I saw four Scissor-tailed Flycatchers (*Muscivora forficata*) at one time within a 150 yard radius. This was on November 18, 1930. About ten o'clock A.M. that day I saw for the first time, three of these long-tailed Flycatchers sitting on power lines. They were not wary and I stood watching them from a few yards without disturbing them. They would dart out and catch a passing insect, spreading their tails and showing the deep fork as they checked themselves, and would return to the identical spot they had just vacated or perch a few yards away.

In the afternoon I returned and this time found four of the birds whose

actions were a repetition of those seen during the morning. For the most part they were silent, but occasionally, a note sounding to me like: *peeee-er-we* was heard and another note I cannot describe.

Three Sparrow Hawks were sitting upon the wires not more than a few yards from these birds but neither molested the other, and no fear or alarm was apparent on the part of the Flycatchers.

Mrs. W. V. Millington, near whose home I found them, stated that she had seen them for several weeks previous, and that they came there almost daily, but were absent during certain periods of the day.

I saw one to four Scissor-tailed Flycatchers daily in Key West, up to November 27; and as the day was quite cool, about 65 degrees, they probably sought some sheltered spot.

Frank Johnston, a boy about twelve years of age told me that the boys catch these long-tailed birds in traps set with corn, and about two months or possibly only six weeks before he had seen seven of them in his chicken yard feeding upon grain. He lived not far from where I had seen the birds, was an intelligent lad and I feel that he knew what he was talking about. He said he saw some last year, 1929, but upon questioning could not remember having seen them at any other time. While conversing with the boy I saw one of the four birds fly down to the ground and pick up something.

A traveling bird student by the name of Keely called up by phone and told me he had seen two Scissor-tailed Flycatchers at the foot of Duval Street and asked if I had seen them?

These birds were quite fearless and I was able to walk on the sidewalk directly under them as they sat on the wires 20 to 25 feet above my head. They did not spread their tail feathers while perching or flying, but only when making a turn or an abrupt stop in midair. The tails of some were fully an inch and one half to two inches longer than others, having a white spot about an inch above the tip giving the appearance of being nicked. The sides were as far as I could discern, pinkish. The underparts were solid grayish white, as were the neck and throat. The upper parts were darker gray.

In all the literature available to me, I find that this bird is of casual occurrence, but not classed as a winter resident. From my experience and that of the boy, this bird should now be classed as an occasional winter resident, at least if a two and a half months stay means anything.—Donald J. Nicholson, *Orlando, Fla.*

The Occurrence of Myiarchus cinerascens inquietus in Lower California.—In a series of *Myiarchus* taken in the northern part of central Lower California, Mexico, during October, 1930, by members of an expedition collecting for the San Diego Society of Natural History, a single smallish, bright-colored example was strikingly evident. The specimen is an adult male, no. 13652, collection of the San Diego Society of Natural History, collected at Cataviña (latitude 29° 46′), Lower California, Mexico, on October 6, 1930, by S. G. Harter.

Comparison of this specimen with examples of *Myiarchus cinerascens cinerascens* from the Lower Colorado River region in southeastern California and *Myiarchus cinerascens pertinax* from the Cape region of Lower California proved that this bird belonged to neither of these two races. In the absence of material for further comparisons, the specimen was shown to Mr. A. J. van Rossem, who tentatively pronounced it to be *Myiarchus cinerascens inquietus*. However, to be absolutely certain of this identification, he requested that the specimen be sent to him at Pasadena, where it could be carefully compared with a good series of *inquietus* in the Dickey collection.

The bird was returned with the following notation: "This specimen is typical *inquietus* and cannot be matched by any so-called 'variants' of either *cinerascens* or *pertinax*." This specimen, therefore, is not only an addition to the avifauna of Lower California, but it also provides the first reliable record of *inquietus* within the territory covered by the 'Check-list' of the American Ornithologists' Union.

Flycatchers stated to be *Myiarchus nuttingi* were formerly recorded from Arizona,[1] but later, when the genus *Myiarchus* was revised,[2] these birds were found to be in reality *M. cinerascens*. *M. nuttingi* was said to occur in southern Mexico and Guatemala, with *M. nuttingi inquietus* occupying the area to the north between *M. nuttingi* and *M. cinerascens*. Recently,[3] intergradation found between the supposed species *nuttingi* and *cinerascens* within the northern part of the range of *M. nuttingi inquietus* places the known races of *nuttingi* in subspecific rank under *Myiarchus cinerascens*. Hence, the use of the name *Myiarchus cinerascens inquietus* in the present instance.

This record of the occurrence of a form whose habitat is the mainland directly east of the peninsula of Lower California is of decided interest ecologically. On first thought, the presence of an individual bird out of its normal range might be termed as accidental. But the physical similarity of this particular part of the peninsula to the Sonoran mainland across the Gulf of California suggests a reason beyond the point of mere accident. The fact that such plants as the giant cactus (*Pachycereus pringlei*) and such birds as the Mexican Screech Owl (*Otus asio cinerascens*) exist in typical or nearly typical form at this latitude on both sides of the Gulf offers some evidence that the attraction to the locality where this bird was captured was not purely accidental.—Laurence M. Huey, *San Diego Society of Natural History, Balboa Park, San Diego, Calif.*

Jay and Bushtit Nesting in Close Proximity.—While looking for Jay's nests in the hills near Benicia, Solano County, California on April 14,

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[1] Fisher, A. K. *Myiarchus nuttingi* in Arizona. Auk, IX, 1892, p. 201.

[2] Nelson, E. W. A Revision of the North American Mainland Species of *Myiarchus*. Proc. Biol. Soc. Wash., XVII, 1904, pp. 21–50.

[3] van Rossem, A. J. Report on a Collection of Land Birds from Sonora. Trans. San Diego Soc. of Nat. Hist., VI, No. 19, 1931, p. 261.

1931, I came across a pair of nests in the lower limbs of a live oak which were very interesting. A Calfornia Bushtit (*Psaltriparus minimus californicus*) and a California Jay (*Aphelocoma californica immanis*) had constructed nests within eight inches of each other, the former being a trifle above and to one side of the latter. Both nests had been constructed in a previous season, possibly two years ago, the heavy, evergreen foliage of the live oak having furnished sufficient protection to keep them in fairly good condition.

Jays have a reputation of robbing eggs and young from the nests of smaller birds, and Bushtits are no exception. It would have been interesting to know if the nests may have both been in use at the same time. Both birds breed at about the same season, for in this vicinity I have collected eggs of each on the same day and from trees not far apart.

Even though it seems hardly probable that the two species could have dwelt so close together at the same time, such close proximity of their nests was interesting.—Emerson A. Stoner, *Benicia, Calif.*

An Old Record for the Western Meadowlark from Ohio.—There is a specimen of a Meadowlark in the Dickey collection at Pasadena, California, which is quite evidently the western species (*Sturnella n. neglecta*). The skin has the following label and history: The label reads "*Sturnella m. magna* ♂ 1 Lakewood, Ohio 4-8-1880." The reverse has printed on it "Collection of Frederic H. Kennard, Collector S. Hall." The skin was obtained by the Dickey collection with the A. B. Howell collection in 1923. Mr. van Rossem of the California Institute of Technology has examined this specimen and pronounced it typical *neglecta*. It is with his permission that I submit the record.—J. Stevenson, *Cleveland, Ohio.*

Observations on the Color of the Iris in the Boat-tailed Grackle (Megaquiscalus major).—In 'The Auk,' (vol. XLV, 506, October 1928) Major Allan Brooks makes certain statements in regard to the iris and habits of *Megaquiscalus major* and *M. m. macrourus*, concluding the note with the request that anyone having "wider knowledge of both birds in life than I possess, come forward with further evidence."

I had definite opinions in regard to one of his statements at the time but concluded to study the question critically and also to wait and see what others would have to say. An examination of every issue of 'The Auk' since that date has failed to reveal any observation and rather than let the request go unanswered and also to give the facts of the case at least locally, this note has been prepared. It is incomplete insofar that it embraces no observations on *M. m. macrourus* as I have never seen that bird in life. With *major* however, I claim intimate acquaintance; since schoolboy days it has been as familiar to me as have "buzzards" and the abundance of the latter about Charleston has furnished material for many stories!

Though having seen and studied the Boat-tailed Grackle from Wilmington, N. C., to Titusville, Florida, the area about Charleston has been the

scene of most of my investigations and it seems strange that there should be any doubt or contradiction as to the color of the eyes of this species. Yet it is evident that confusion does exist and I have received letters from northern ornithologists asking for first hand information on this very subject, as they state that little or nothing can be found on it in ornithological literature. Perusal of my own limited library bears out this assertion. Only in the 'Birds of America' of the Nature Lover's Library, published by the University Society, New York, 1923, Editor-in-Chief, T. Gilbert Pearson, does any information appear and the color of the iris in *major* is there listed as "light yellowish."

Major Brooks makes the statement that in this species the iris "is always dark brown" and it is this assertion which is utterly at variance with all the observations I have made for many years. As I have seen it the iris in *major* is invariably yellowish in the male bird. It differs in shade, running from lemon yellow to a deep straw color but *always* yellowish and so distinct that it may be seen at a considerable distance. I have called this fact to the attention of numerous visiting ornithologists and not one had failed to note it, indeed, they could not but see it. In females of *major* the iris is sometimes yellow but usually a light brown which, at some distance, gives the appearance of being dark. Young males have a brownish iris but immediately lose it on attaining full plumage and assume the yellow. I have asked Messrs. Herbert R. Sass and Edward S. Dingle about this matter as they are just as familiar with *major* locally as I am and they expressed surprise that there should be any doubt about the yellow eye.

In regard to Major Brooks' statements tnat *macrourus* is a noisier bird than *major* and that they seem more inclined toward human habitation, I cannot say, never having studied the former but if there is any noisier bird than the Boat-tailed Grackle it must be a seven-days wonder. This species comes freely into towns and cities along the South Carolina and Georgia coasts and is a daily sight in abundance, nesting commonly in close proximity to houses in Georgetown and Beaufort, South Carolina and Brunswick, Georgia as well as the city of Charleston. And everywhere one finds it the bird calls, croaks, screams, groans, clacks, grunts and shrieks in never ceasing din. However, the Great-tailed Grackle may excel it in these points but as to the color of the iris I take exception. I have yet to see a male bird of *major* which lacks the yellow eye. Like Major Brooks I reiterate the request that others voice their observations on this matter.—ALEXANDER SPRUNT, JR., *92 South Battery, Charleston, S. C.*

Bohemian Waxwings in Colorado.—It is highly probable that the 1930–1931 invasion of the northern parts of the United States by Bohemian Waxwings (*Bombycilla garrula*) was not nearly of the magnitude of that of 1916–17, yet it was widespread in Colorado, and also in large numbers.

Only one locality in the State, usually reported upon by my friends, exhibited none of these birds during the last winter. Mr. and Mrs. Geo. J. Bailey of Walden, Colorado (North Park) believe that their neighbor-

hood was not visited by Bohemian Waxwings during the past six months because it is practically, for miles, treeless and hence devoid of food for any Waxwings that might reach and pass through it.

It would look as though these birds travel from the far north along the Rockies, and on reaching the latitude of Colorado, debouch out on to the plains via the rivers and creeks arising in the mountains. Some of the facts relating to last winter's Waxwing invasion recorded by my co-workers lend color to this belief. It is known that flocks occurred in high areas, for Mr. John Weldon of Loveland, Colorado, noted some on Baldpate Mountain, Estes Park, Colorado, on December 16, 1930.

The earliest recorded arrival date of this species in Colorado was that of November 9, 1930, flocks appearing at that time at the home of Mr. and Mrs. John Weldon located next to the foothills bordering the mouth of the Big Thompson River Canyon, a river arising in the high peaks encircling Estes Park.

The wave of southward sweeping Bohemian Waxwings must have been large and wide for the birds appeared on the Pacific slope at Fruita, Colorado, on the Grand River, on November 25, 1930, their first appearance recorded by Mrs. Anna Benson, whose home is in Fruita. These Waxwings extended, in Colorado, at least as far east as Fort Morgan for Mr. Edw. Hellstern first saw them there on November 10, 1930.

The foregoing records show that the southward advancing wave of Waxwings in this State was at least two hundred and fifty miles in width, probably having a fairly even distribution of individuals over much of this territory.

Mrs. W. B. Berger of Denver was one of the first observers to note Cedar Waxwings mixed with the flocks of their larger cousins, first seeing a mixed flock at her home on December 4, 1930. One other observer, Mr. Hellstern of Fort Morgan also saw such mixed flocks, one containing not less than fifty Cedar-birds on December 1, 1930.

A report from Mrs. H. E. Mierow of Colorado Springs, Colorado says that Bohemian Waxwings were seen in her home area more or less constantly during the December and January just past. Mrs. Mierow's observations fix the known southern limit of this winter's Bohemian Waxwing invasion in Colorado as far, at least, as her home city. It is safe to assume, from the notes sent to me by my obliging correspondents, that the area invaded by these birds during the past winter extended north and south from Loveland to Colorado Springs (125 miles), and east and west from Fort Morgan to Fruita (250 miles). These data make it easy to see that the Waxwing visitors spread over an area at least 30,000 square miles in extent. The birds were probably fairly evenly distributed over this terrain since flocks were seen and studied at ten more or less widely separated localities located within this large square-milage.

As in 1916–17 the flocks promptly stripped the local Russian olive trees of their berries, ate any other fruits growing on ornamental trees and shrubs,

consumed hanging apples, and when these natural foods failed, found sustenance at garbage pails, and from food put out for dogs.

The birds of this winter's visitation were extraordinarily tame, often permitting so close an approach that the "wax" tips to the wing feathers became apparent.

Waxwings were last seen on the eastern slope of the Rockies, at Loveland on April 10, 1931, and on the western slope of the mountains at Clifton on April 5, 1931.

A résumé of the localities in Colorado where the Bohemian Waxwings were seen during the past six months, with the observer's name, and the dates when first and last seen is as follows:

Loveland; Mrs. John Weldon; November 9 and April 10.
Fruita; Mrs. Anna Benson; November 25 and March 19.
Clifton; Mrs. Anna Benson; last seen April 5.
Denver; Mrs. W. B. Berger; first seen December 4.
W. H. Bergtold; last seen March 6.
Fort Morgan; Edw. Hellstern; November 10 and January 24.
Estes Park; J. H. Weldon; seen only on December 16.
Littleton; Mrs. R. J. Kerruish; December 17 and March 20.
Colorado Springs; Mrs. H. E. Mierow; December 8 and March 10.
Fort Collins; Mrs. Clara Gordon; December 22 and March 24.
Ione; Mrs. T. C. Forward; January 15 and March 19.

My appreciation and thanks are now expressed to all these obliging friends who have helped make this summary possible.—W. H. Bergtold, *Denver, Colo.*

Prothonotary Warbler (Protonotaria citrea) in Southern New Jersey.—On May 16, 1931, in company with Mr. Arthur C. Emlen, I saw a brilliant specimen of the Prothonotary Warbler on the Egg Harbor River, at "Fourways" Cabin above Mays Landing, N. J. We studied it for some fifteen minutes as it flew in and out of the bushes ahead of our canoe.—Witmer Stone, *Acad. Nat. Sciences, Phila.*

Brewster's Warbler at Lancaster, Pa.—On May 8, 1931 at Long's Park, just outside Lancaster City, I was lucky enough to obtain a very fine view of Brewster's Warbler (*Vermivora leucobronchialis*). I believe this to be the second record of this bird in this county. I think Dr. H. H. Beck of Lititz, Pa., has a record of it some years ago.

This individual was marked like a typical Golden-winged Warbler but with a white throat and a small black line through the eye. The song resembled that of the Golden-wing—*ze-ze-ze-ze-zwee*—the last note dropping two full tones.

Instead of the usual one or two records of the Hooded Warbler, this spring, I have three of my own and five or six reports of it in the county dating from about May 4 to 10.—W. Stuart Cramer, *44 E. Orange St., Lancaster, Pa.*

Audubon's Warbler in Northern Ohio.—On April 30, 1931, I observed an Audubon's Warbler (*Dendroica a. auduboni*) at the head of the Upper Lake in Shaker Lakes Park, Cleveland, Ohio. The bird was a bright male and was accompanied by a female bird which might have been either *D. auduboni* or *D. coronata*, its markings being rather obscure. The throat of the male was bright yellow; the tail showed more white in flight than *D. coronata* (I made a particular note of this fact, although I was not aware at the time that this was a distinguishing feature); the breast was apparently more heavily marked with black than that of *D. coronata;* the call note was indistinguishable from that of the eastern form. The bird was observed several times at 25 to 30 feet through 8 × glasses in bright sunlight.

The next day I studied the series of specimens of *D. auduboni* in the Cleveland Museum of Natural History.

On May 3, 1931, I again visited this place and found the bird within 100 feet of the spot at which I had first seen it. With the characters of the skins I had examined fresh in my mind I noted all the field marks again, reassuring myself that my original identification was correct.

Mr. John Aldrich of the Cleveland Museum informs me that this is the first record for Audubon's Warbler in Ohio and believes that it is only the third record for the territory east of the Mississippi.—William H. Watterson, *Cleveland, Ohio.*

Hermit Warbler in Minnesota.—On May 3, 1931, I took a Hermit Warbler (*Dendroica occidentalis*) in a tamarack swamp about a mile north of Cambridge, Isanti County, Minnesota. The bird is a full-plumaged male and is now in the collection of the University of Minnesota Museum of Natural History. This is the first record of this species for Minnesota. —Alden Risser, *1012 Laurel Ave., St. Paul, Minn.*

Eastern Records for the Russet-backed Thrush (Hylocichla ustulata ustulata).—In the collection of the Carnegie Museum are two specimens of this western bird from eastern localities. A female example (No. 6435) from Smith's Island, Virginia, May 21, 1899 (Percy M. Shufeldt), is a close counterpart of our Oregon series of *ustulata*, and must have been a stray bird that got off its course in the northward migration. No. 29,797, from Shelter Island, New York, October 2, 1894 (W. W. Worthington), I would also refer to the western race, with which it agrees exactly in the color of the upper parts; the spots on the breast, however, are rather darker, more as in *swainsoni*, but I lay this to season.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh, Pa.*

Additional Species for the Georgia List.—

Larus hyperboreus. Glaucous Gull.—It is seldom that one can sit in the shade of his own vine and fig tree, and have rare species come to his very door, but recently I have taken two of these large white winged Gulls, and both were shot from the deck of the dredge, while working near Quarantine Station, below Savannah. One female was taken on February 28,

1931 and another, also a female, on April 14, while one, possibly the last one collected, was seen near the city, fourteen miles away, on April 6.

So far I have been unable to find any records of this species in this state, and there are no South Carolina records, according to Mr. Alexander Sprunt, Jr.

The first bird shows much darker plumage than the last, but both are distinctly immature birds, both because of the feathers of the tail and back marked with color, and by the color of the iris, which in each case was brown. I have assumed that this species parallels the Herring Gull (*Larus argentatus*) in that the color of the iris is brown in young, and yellow in the fully adult bird. Coues in his 'Key to North American Birds' says that the eye is yellow in the Glaucous Gull. Other works at hand do not mention any change of color with age in this or the Herring Gull, but it is perfectly apparent in the flock of Herring Gulls that has been with us all winter. The bill color in the birds taken was also that of a young bird.

I am indebted to Mr. Ernest Wells, of this plant, for noticing the first bird, and for calling me from my work when it returned the next day. He was also present when we saw the one on April 6 and we both marked the whiteness and large size, as compared with the other species present.

Pluvialis dominica dominica. GOLDEN PLOVER.—A single bird, taken on Oysterbed Island, Georgia, on April 10, 1931, is the only record of this species in recent years, though in the time of its abundance elsewhere, it may have been more common here in migration. This bird was alone, though in the vicinity of some Wilson's Plovers, which birds were going through their courtship antics. All over the several miles of beach near, Black-bellied Plovers were scattered, and it seems odd this bird did not seek their company. It was partially moulted into summer plumage, and was a male.

Wayne, in his 'Birds of South Carolina' (1910) mentions one specimen taken in that state, and Bent (U. S. Nat. Mus. Bull. 146, page 193) tells of several from the Atlantic coast south of North Carolina, all of which are fall records. Howell, in 'Birds of Alabama' records none from that state, despite the fact Alabama is nearer the spring migration route, than this part of Georgia.

The record is all the more remarkable because of the scarcity of spring records, among the few casual appearances of the species on this part of the coast.—IVAN R. TOMKINS. *U. S. Dredge 'Morgan,' Savannah, Ga.*

Some Bird Records from Florida.—*Pelecanus occidentalis occidentalis.* BROWN PELICAN.—When in 1923 the Brown Pelicans deserted Pelican Island near Sebastian, Florida, they were reported to have gone to a crescent shaped island southeast of the old "Haul Over Canal" in the south end of Mosquito Lagoon in Brevard County, Florida. I endeavored to gather from older residents of that region what evidence I could as to the previous occupation of that island. I wondered whether it was a new island for the Pelicans or if they had returned to an ancestral home. Some evidence seemed to favor the latter conclusion.

Referring to my notes of our early days in Volusia County, Florida, I found record of several conversations with the late Mrs. F. W. Sams, who was born at New Smyrna, Florida, April 9, 1847. She was a very intelligent woman, and well informed concerning the natural history of Florida. I have also records from other old residents. In the spring of 1912 Mrs. Sams gave me the following information about the Brown Pelicans. "They never nested commonly, if at all, at Mosquito Inlet. I knew of a few, perhaps a half dozen, nesting on a little island west of the inlet in 1866. At one time these Pelicans were as numerous on the island above Port Orange (then called Pelican Island) as they now are at Mosquito Inlet, but they did not nest there. The number at Mosquito Inlet was then estimated at 1000 to 1500 birds.

"I have seen them nesting in large numbers in trees and bushes on an island (also known as Pelican Island) in Mosquito Lagoon, east of the old 'Haul Over Canal'."

Mr. R. S. Sheldon, a brother of Mrs. Sams, stated on September 9, 1929, that as far back as any one can remember the Brown Pelicans nested in great numbers on a small island in the Lagoon (the same one above noted), and continued to do so until about ten years after the Civil War. They still nest there but not in the great numbers of the olden days. Capt. Murray Lourcey, a well-known old Indian River pilot, also tells of the Pelican "rookery" at the south end of Mosquito Lagoon.

The following have at different times been known as "Pelican Island": (1) Island above Port Orange; (2) Island south end of Mosquito Lagoon; (3) Island near Sebastian.

Pelecanus erythrorhynchos. WHITE PELICAN.—Mrs. Sams says: "About 1908 or 1910 a few of these were seen about Mosquito Inlet. None seen there before that time. Have seen hundreds of them at Mosquito Lagoon. They do not breed there."

Larus atricilla. LAUGHING GULL.—Mrs. Sams stated: "The Blackheaded or Laughing Gulls years ago nested by thousands on the same island in company with the Pelicans. The Gull's eggs were found in enormous quantities. We gathered them for food and found them to be very good."

Mr. R. S. Sheldon, brother of Mrs. Sams, says the Laughing Gulls still nest on the same island in the Lagoon. They collected eggs by the thousands in his younger days.

Haematopus palliatus. OYSTER-CATCHER.—Oyster-catchers formerly nested on some islands east of the same old canal. I found a half dozen nests and gave some eggs to Dr. Henry Bryant for the Smithsonian Institution. (Mrs. Sams).

Xanthocephalus xanthocephalus. YELLOW-HEADED BLACKBIRD.—Mrs. F. W. Sams told me she killed a Yellow-headed Blackbird at Oak Hill, Volusia County, Florida, in 1872. She gave it to Captain Peters and thought it probably went to the Smithsonian Institution.

Dendroica discolor. PRAIRIE WARBLER.—March 23, 1909, singing its fine low song. It is something of a ventriloquist. Frequents the mangroves

on the islands. Sometimes quite numerous. Said to nest here. Sat in a boat, minutes at a time watching one of these birds which was only five feet away. Its song sounds to me like this: *we, we, we, we,* slightly rising to the fourth, which is given with emphasis; then shorter and more rapid like *wi, wi, wi, wi-i-i-i,* with last three notes still shorter and ending very high. The song is repeated frequently, at times with fewer syllables, but always with the same characteristics. To me it is the Mangrove Warbler. [This is the recently described Florida Prairie Warbler, *D. d. collinsi* H. H. BAILEY.]

Tyto pratincola. BARN OWL.—Seen at old Fort St. Augustine, Florida, February 8, 1908. The custodian of the Fort showed me two of these Owls which he said were of a brood of four. He stated these were young birds which had been hatched in one of the chambers of the Fort and that the eggs were laid in August last (1907).

Campephilus principalis. IVORY-BILLED WOODPECKER.—Mrs. Sams told me she saw, in April 1911, an Ivory-billed Woodpecker about two and a half miles west of Turnbull Hammock, near New Smyrna, Florida. She also said: "About 1907 I saw two of these birds while going to the 'big tree' in Turnbull Swamp, west of Ariel. It is a rare bird here. I have never seen any except in secluded places in Turnbull Hammock."

Mrs. Sams gave me the skull of an Ivory-billed Woodpecker, one of two killed by her cousin, Tom Murray, on the Kissimmee. I saw Mr. Murray and this is his account: "I killed a pair of Ivory-billed Woodpeckers, November 1908 on the St. John's River about fifty miles below St. Cloud or Kissimmee. I skinned the birds and brought them home. The skins spoiled but I kept the skulls, one of which I gave to Mrs. Sams for you. Another person killed one also but only its head was preserved. The last time I saw Ivory-bills near New Smyrna was about 1903 or 1904. I think a few are to be found in the cypress swamps near here yet (1912)."

Charles Dury says: "In 1874 and 1875 I searched for this species in Volusia County, Florida, but saw none. In 1877 Mr. John S. Baker bought an adult male from a hunter who shot it in Volusia County (No. 21, Cuvier Club, Cincinnati, Ohio.)

Conuropsis carolinensis. CAROLINA PAROQUET.—Two, male and female, procured by H. C. Culbertson, February 12, 1893, Kissimmee, Florida. Mounted by Charles Dury, Cuvier Club Collection, Cinncinati, Ohio.

Mr. Dury in a letter says: "My note book mentions seeing a flock of eight Paroquets flying over the St. Sebastian River, February 12, 1874. The birds were very shy." The same writer also says: "While riding from (New) Smyrna to Enterprise, Florida, late in April, 1874, I saw a small bunch of six Paroquets. They flew across the road alighting in a tree in front of the wagon. While a fellow passenger was getting out his gun they darted away. At this time the species was very scarce. My note book mentioned going out to Dunlawton plantation (two miles from Port Orange) after Paroquets several times but 'none seen'."

Mr. Tom Murray said: "The last Carolina Paroquet I saw was about

1892. It was on the other side (west) of Turnbull Hammock. I have in my time killed hundreds of them. They were in the above Hammock up to 1900 or 1902. I am told there are some down on the 'Chobee near Lake 'Chobee (Okechobee) (1912). I never saw their nests but I know a man, Alfred Grover, who found them nesting in a hollow cypress on the Tomoka River about 1892. He got their eggs and hatched them and had about twenty young birds."

Captain F. W. Sams told me he saw a flock of eight or ten Paroquets in 1909 at Cabbage Slough on the west side of Turnbull Hammock, some twelve or fifteen miles southwest of New Smyrna. He said: "they ate cockspurs, cockleburs and cherries. Those who hunted them lined them, like a bee hunter lines a bee to its tree. When they found their roosting place in a hollow tree they caught the whole flock by putting a net over the hole by which they entered and left. They also caught them in a net by using a crippled bird as a stool pigeon."

Mrs. F. W. Sams said: "I never saw a Paroquet's nest but I have known. persons who have seen them. John Saul, of Enterprise, Florida, found their nests in a hollow tree. He could not get to them. There were young birds and the old birds were carrying food to them. All the nests I have heard of were in Cypress swamps. In such places as the Egrets' nest. Formerly they were very common here. They fed upon cockleburs and sandspurs. They were very fond of prickly ash berries and came in such numbers as to cover the trees. I have winged Paroquets and put one in a room when the whole flock would come in to it. Among these I observed young birds that were barely able to fly. They were resident here."

Following an inquiry made of Mr. Robert Ridgway, I have his reply of April 5, 1920. He says: "I do not remember that I ever published anything in connection with my experience with Carolina Paroquets in Florida. I met with them at two localities: about twelve or fourteen miles southwest of Kissimmee and on Taylor's Creek near Lake Okeechobee. At the latter place, I secured 26 specimens from a single flock, besides three others which, being only slightly wounded, I brought home (to Brookland, D. C.) and kept in captivity for several years. Two of them mated and reared a brood of young, all of which grew to maturity. One by one they died, from a sort of menengitis, possibly from eating too much hemp seed."

Creciscus jamaicensis. Little Black Rail.—April 12, 1912, Mr. B. J. Pacetti of Ponce Park, Florida, brought me one of these Rails. He said it was killed the night before by striking the Mosquito Inlet Lighthouse and stated that several others of the same species were found dead.—Amos W. Butler, *Indianapolis, Ind.*

Combined Protection of Young Birds.—In crossing a small pasture lot in the spring of 1927, as I approached a small hawthorn, a pair of Brown Thrashers (*Toxostoma rufum*) flew at me, screaming. An investigation revealed a nest two feet from the ground, with four young birds. The parents expressed their annoyance by a sharp-whistled "*when*," flap-

ping their wings and twitching their tails, which attracted the attention of another Thrasher and a pair of Catbirds (*Dumatella carolinensis*) which came to their aid in defense of the young. The new comers joined in with the parents both vocally and physically until I left the lot.

In an early May morning in 1930 in a quiet garden, the parents of a young Robin (*Planesticus migratorius migratorius*) were teaching it how to fly. Suddenly a neighbor's cat slipped over the fence, caught the young Robin and started for home. The parents in their frantic effort to make the cat release the bird, attracted the attention of another Robin and a pair of Cardinals (*Cardinalis cardinalis cardinalis*) nesting nearby in a honeysuckle. All five birds jumped on the cat's back, screaming and pecking it so vigorously that it released the young Robin and returned home. The Robins left the garden but throughout the day at sight of the cat the Cardinals screamed and flew at her.

For four or five years a pair of Blue Jays (*Cyanocitta cristata cristata*) has nested in our yard. Even after the young are grown, at the approach of a cat, dog or person, at least five Blue Jays appear screaming and, in all cases except one, the screaming put the intruder to rout and in this case the cat was attacked by pecking and soon fled.—Myra Katie Roads, *Hillsboro, Ohio.*

Bird Injured by High Tension Wire.—I had long adhered to the belief that a bird is not subject to danger of eloctrocution or ignition by perching on a high tension wire, except contact be made with one wire and the ground or two wires. Due to the manner in which such wires are commonly placed this would amount to almost an impossibility. A unique exception to this belief occurred in the following incident.

It was not my privilege to be present to observe personally the details of the casualty, hence, they were collected from reliable spectators, and are related with slight mutation as obtained.

A high tension wire, carrying 23,000 volts passes through the village of Franklin Square, Ohio. The wires are, as usual, frequently utilized for perches by birds.

On August 23, 1930 a report which was audible for some distance was heard by the residents of Franklin Square, a number of whom immediately gathered about the place of its source. Up to a few moments after its fall, fire could be seen emanating from one end of the high tension wire which had broken and fallen to the ground.

The line-men which had been summoned to the scene soon appeared. A badly burnt bird which had been previously noted hopping about in the grass nearby (about fifteen feet from directly beneath where the wire broke) was then captured by the men and pronounced a Flicker. From information obtained, however, I suspect it to have been a Robin. Performing an act of mercy as they claimed the bird was killed and taken away, and, thus, was not available for unquestionable identification.

The plumage had been almost completely consumed by fire, the only

remaining portion was the quills and rachis of the contour feathers, all down as well as the webs of the contour feathers were burned.

With a desire of obtaining an explanation of the cause and probable frequency of an occurrence of this nature a competent Cleveland electrician was consulted. I am indebted to him for the following analysis, and can do no better than to quote from his recent reply to my inquiry.

"Will say that a similar incident may have never occurred before, and may not again.

"In my opinion the bird did not get shorted across the wires or grounded with same or it would have been killed. It probably was sitting on the wire very near where same broke, and was in the path of the arc which was caused by the breaking of the path of the flow of electricity.

"The break in the wire was caused by a flaw or injury to same, and probably would have broken even if the bird did not alight on it. An arc is due to the flow of current being broken when carrying a high voltage and amperage and may be from a fraction of an inch up to several feet, similar to a flash of lightning, which forms a high heat unit."—PAUL A. STEWART, *Leetonia, Ohio.*

Original Publication of Chionophilos alpestris insularis.—The Horned Lark which inhabits the islands of Santa Cruz, San Clemente, etc. off the Californian coast, recognized first by Dr. C. H. Townsend to be a separate race, has been known by the name *Otocoris alpestris insularis* Townsend, dating from September 9, 1890, when Townsend's description was published (Proc. U. S. Nat. Mus., XIII, p. 140). The late Dr. Jonathan Dwight published a review of the Horned Larks (Auk, VII, pp. 138–158, April, 1890). On page 152 (in text) Dr. Dwight says: "Mr. C. H. Townsend has kindly loaned me a series of ten male Horned Larks from the Santa Cruz group of Islands, California, including the type of the bird which he calls *insularis*. I am much surprised to find his birds practically indistinguishable from Orelogon specimens of *strigata*. They are the same size and though averaging a little darker, the nape approaching brick red, some of them can be matched by the few specimens of *strigata*, I have for comparison, etc." This constituting a dragnosis, and being the earliest use of the name *insularis*, the name should now be: *Chionophilos alpestris insularis* (Dwight). The original citation is: [*Otocoris alpestris*] *insularis* (Townsend Ms.) Dwight, Auk, VII, p. 152 (in text), April, 1890—"Santa Cruz group of Islands, California"; the type in the U. S. National Museum is from San Clemente Island (fide Townsend). The generic name *Chionophilos* Brehm, 1832, has priority over *Otocoris* Bonaparte, 1838 (cf. Laubmann, Verh. Orn. Ges. Bayern, *15*, p. 222, 1922).—C. ELIOT UNDERDOWN, *Field Museum of Natural History, Chicago, Ill.*

[While *Otocoris a. insularis*, as mentioned by Mr. Underdown, actually first appeared in Dr. Dwight's paper, the fact should be noted that the species was described by Dr. Townsend, and it was only due to a delay in the publication of his paper that the name first appeared elsewhere. Dr.

Dwight would have been the last person to consent to the use of his name as an authority for *insularis* in such a case as this. The species should be credited, as is done by the A.O.U. Committee, to Dr. Townsend, but the citation should be (Townsend MS) Dwight, Auk, VII, p. 152.

Chionophilos as a generic name is of doubtful validity and is not recognized by the A.O.U. Committee. There is some question as to whether it is anything more than a common name as used by Brehm in 1832.—T. S. Palmer.]

Notes from Escambia County, Florida.—*Morus bassanus.* Gannet.—One of the very few instances of the occurrence of this Atlantic coastal species anywhere in the Gulf of Mexico was noted on April 5, 1931, off the outer beach near Pensacola, about ten miles from the Alabama State line. In all, three birds were seen—two adults and one in immature plumage. They passed singly at about five-minute intervals, beating westward against a strong northwest wind. Each was in sight for three or four minutes, affording the observer ample opportunity to study them at ranges under 500 yards with 6 x glasses. On May 6, 1931, a single bird in immature plumage was seen briefly at a great distance off the beach.

Pisobia bairdi. Baird's Sandpiper.—Since the capture of the first specimen of this western species in Florida (Auk, vol. XLV, p. 370, July, 1928) on April 22, 1928, constant watch has been kept on the beaches for the possible occurrence of others, but none was seen until May 2, 1931. On that day, a single bird in spring plumage was discovered on the inner beach at a point not 200 yards from the spot where the 1928 specimen had been taken, and it was studied for several minutes with 6 x glasses at a distance of not more than 25 yards. The bird then joined a small flock of Least Sandpipers (*P. minutilla*) and a single White-rumped (*P. fuscicollis*), when further study at much shorter range gave excellent opportunity for size and color comparison. To clinch the identification, the flock was flushed and the upper tail coverts of the two larger Sandpipers compared in flight. On May 6, 1931, another single bird (possibly the specimen of May 2) was seen, also on the inner (lagoon) beach, at a point about three miles to the westward.

Bartramia longicauda. Upland Plover.—Occurrence of this species during the 15 years of the writer's residence in this region has been so infrequent as to be considered accidental. On March 25, 1931, a single bird was seen in company with Killdeers and Pipits on a little-used airplane landing field, known as Old Corry Field—a locality that, through oversight, had never been included in the writer's search for this species. Again on March 30 the field was visited and two Plovers were found—both so tame that they allowed the approach of an automobile to within about 10 yards. On April 8, five Plovers were seen at the same place. During the intervals between the foregoing dates, other observers visited the field and found the birds present. It is not unlikely that a careful watch maintained over this area in the future will show the species to be a regular, if uncommon, transient.

Passerina ciris ciris. PAINTED BUNTING.—On May 2, 1931, Mr. Duncan McIntosh, one of a visiting party of bird students from Alabama, found and pointed out to the writer an adult male Painted Bunting among the scrubby growth on the sand dunes near the beach. Several brief but satisfactory glimpses of the bird were obtained. The only other instance that has come to the writer's attention during 15 years' residence was also of an adult male bird, seen and described by Miss Isabelle Ingraham, of Pensacola, on April 12, 1925. In view of the regular occurrence of this species in the same latitude both to the eastward and to the westward, its rarity in the central Gulf Coast region is inexplicable.—FRANCIS M. WESTON. *Bldg. 45, U. S. Naval Air Station, Pensacola, Fla.*

RECENT LITERATURE.

Stoddard's 'The Bobwhite Quail.'—Some years ago the Committee on Coöperative Quail Investigation began a comprehensive study of the Bobwhite in portions of the Southern States with a view to its possible increase in a natural state and on game farms, so as to insure a supply of the birds for those who enjoy Quail shooting. The work was undertaken in coöperation with the U. S. Biological Survey and Herbert L. Stoddard was placed in charge of the investigation which covered the period from March 17, 1924 to June 30, 1929. Two reports of progress were published in 1924 and 1926, respectively, which were duly noticed in these columns, and now we have the final report,[1] probably as exhaustive a monograph as has ever been prepared on a single species of North American bird.

The stout volume of nearly 600 pages is divided into twenty chapters which seem to cover every phase of Quail history. The types of southeastern Quail territory are first described and it is explained that Mr. Stoddard's intensive studies were mainly limited to the region between Thomasville, Georgia, and Tallahassee, Florida. Under Life History are considered, mating, fighting, nesting, rearing, breeding, feeding, roosting, etc., while separate chapters are devoted to Calls, Plumage, and Development. The well known "Bobwhite" call is in Mr. Stoddard's opinion, and as the result of long and careful study, not the call of the mated bird but "*largely* the call of the unmated cocks, ardent fellows eager to mate but doomed to a summer of loneliness, from lack of physical prowess or an insufficient number of hens to go around."

In the discussion of plumage there is an account of the curious erythristic phase that has developed in the covies of the Ames Plantation at Grand Junction, Tennessee, a bird totally unlike the familiar Bobwhite. The chapter on food of the Bobwhite is contributed by C. O. Handley and Clarence Cottam and is a most valuable analysis. Various small fruited leguminous plants seem to be the favorite sources of the bird's vegetable food, though seeds of pine, oak and sweet gum are also sought, as well as seeds and sprouting seedlings of various weeds.

Movements of the Bobwhites were studied by extensive banding and trapping and it was found that coveys usually consisted of two or three families with some stray or unmated birds and that they numbered from twelve to fourteen individuals on the average, although some contained as many as twenty or even twenty-eight. As the winter advances the neighboring coveys tend to mix but on the whole the Quail of the southeastern States is sedentary and does not move far from the region in which it was

[1] **The Bobwhite Quail, Its Habits, Preservation and Increase. By Herbert L. Stoddard, Bureau of Biological Survey, United States Department of Agriculture. New York, Charles Scribners' Sons. 1931. Pp. i–xxix + 1–559, 69 plates and 32 text figures. Price $6.00.**

raised. The species is therefore well adapted for increase, if a suitable area is selected where proper food and cover are present.

Out of 600 nests studied 223 or 37% were destroyed by natural enemies, 20% deserted, and 36% were successful. The culprits with number of nests destroyed were as follows: skunks, 65, cur dogs, 19, cats, 13, cotton rats, 21, opossums, 7, Blue Jays, 6, Crows, 5, red ants, 24, negros 10 and snakes, number not ascertainable as they rarely leave any clues.

As to destruction of young or adult birds, Loggerhead Shrikes proved to be a serious menace on propagation farms. Of the Hawks, Mr. Stoddard finds no case against the Sparrow Hawk, Red-shoulder and Broad-wing while in the case of the Red-tail he says the good they do (in destroying rodents) more than offsets the harm. The Marsh Hawk which is so frequent about Quail country and breeding farms is mainly after cotton rats and out of 1098 pellets of this species examined only one contained remains of a Quail. Mr. Stoddard adds an important item to the history of this Hawk by keeping a captive bird and recording the various foods that it consumed. Every bird and mammal eaten was evident in the pellets thus disposing of the claim that pellet examination is not a true index of the bird's food. The Cooper's and Sharp-shinned Hawks are the only species really dangerous to Quail.

The Owls with the exception of the Great Horned are absolved from blame and are very valuable in destroying rodents.

Our author sums up the matter with the statement "We do not advise the killing on the grounds of Quail preservation of Red-shouldered, Broad-winged, Marsh or Sparrow Hawks or any of the Owls with the possible exception of the Great Horned Owl, for the record of these birds shows that the balance is decidedly in their favor. While some kill an occasional Quail caught at a disadvantage, the occurrence is not frequent, and their destruction of more important Quail enemies makes these birds of decided value." Cannot game farm owners impress these economic facts upon their keepers and save these valuable birds from extinction?

Three chapters of Mr. Stoddard's book are devoted to Quail parasites and diseases, that relating to internal parasites being contributed by Eloise B. Cram, Myrna F. Jones and Ena A. Allen of the U. S. Bureau of Animal Industry.

The latter half of the volume is devoted to Quail preserves and their management in which we learn of the value of rough agriculture on the preserve, and of occasional firing to keep down the broom grass. In the pages devoted to control of the cotton rat, the most destructive rodent in Quail culture, we find the significant statement after explaining the use of poisoned grain: "If for any reason poisoning is considered undesirable cotton rats may readily be trapped although trapping is more cumbersome and expensive." We trust that officials of the Biological Survey may take this statement of one of their own men to heart in considering further poisoning operations in the West.

We have but touched upon the wealth of information contained in this

notable volume and everyone interested in game farms and in wild life conservation should read it in its entirety. The numerous illustrations add greatly to its value. There are several color plates by Kalmbach and some sixty-five halftone plates, beside numerous text figures. Mr. Stoddard and his associates, as well as the Committee which made the investigation and publication possible, deserve the thanks both of ornithologists and sportsmen. Such scientific investigations as this are what we need before policies or regulations can be intelligently formulated. Too often those in charge of game preservation, ignorant of the problem, rush in and destroy valuable wild life for the extermination of which future generations will hold them responsible.—W. S.

Leopold's 'Game Survey of the North-Central States.'—There are several agencies interested today in the preservation of game: the hunters who find in its pursuit sport and recreation; the naturalists who in its species find interesting subjects for scientific study; the conservationists who stand firmly against the extermination of any species; and the firearms and ammunition makers whose business will be wiped out if game disappears or becomes so scarce as not to be worth pursuing.

Until recently the only measures for preventing extermination of game by the constantly increasing horde of gunners have been the close season and the bag limit, enforced by law, and the sale of hunting licenses to secure funds for game law enforcement.

Lately the possibility of breeding game birds and liberating them, primarily on privately owned or leased land, or on reservations, has been recognized and practised with some success, but the difficulty of meeting all of the problems that present themselves has demonstrated the need of far more extensive knowledge of the habits of game, its relation to its environment, and to man's various activities.

Some of the sportsmen have made an important move in this direction in their Quail investigation and Mr. Stoddard's volume on Bobwhite presenting the results of the research has just been reviewed. Unfortunately the majority of hunters have been willing to go ahead with their hunting so long as any game at all is to be found, with little or no thought of the future and with assurance that conditions will improve. The arms manufacturers, to whom game extinction means more in dollars and cents than to any of the other groups, have recently become thoroughly alarmed at the decrease in game. They are fully awake to the situation and have sponsored a careful and exhaustive survey of the whole problem. Their first report,[1] a game survey of the north central states by Aldo Leopold, a well equipped authority on the subject, is now before us.

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[1] Report on a Game Survey of the North Central States Made by Aldo Leopold for the Sporting Arms and Ammunition Manufacturers' Institute under direction of its Committee on Restoration and Protection of Game. Madison, Wisconsin. 1931. Pp. 1–299. Price $1.00 from American Game Association, Investment Bldg., 15th and K Sts., Washington, D. C.

In it we have one of the most reliable summaries of the subject that has yet appeared. Arms manufacturers can hardly be charged with any desire to distort facts, as their whole object is obviously to produce more game, while such an investigation as they have sponsored is not dependent upon government or state appropriations and is therefore free from political influence.

Mr. Leopold's work has been well done and his report is crammed with valuable information which will require time to fully digest, but which should be carefully studied by all interested in conservation. He does not pretend that it is exhaustive and he points out many questions which are still unsolved. He has made use of various published reports but has checked most of their findings, while he has gathered a vast amount of first-hand information. His chapters cover Bobwhite, Rabbits, Ring-necked Pheasant and Hungarian Partridge, the Game Cycle, Ruffed Grouse, Prairie Chicken, Big Game (Turkey and Deer), Water-fowl, Predators, Game Lands and Administration, and the Conservation Movement.

In the case of the Bobwhite he tells us that from a "pre-settlement" stage of its abundance there came a period of definite increase with the first rough agricultural activities of the pioneers. Then came a period of decrease as agricultural activities were intensified, when wire fences replaced the old fence rows and guns and dogs took the place of primitive trapping, and finally a time of further decrease as greater leisure was enjoyed by the population, hunters increased in number and improvements were made in guns and ammunition, while automobiles made it possible for individual gunners to cover vastly greater territory. Finally came the posting of lands and the removal of the Quail from the game bird list in several states in an effort to save it from extermination.

Now come the possibilities of Quail as a crop and the problem of interesting the farmer in restoring some of the more primitive conditions which formerly made for Quail increase. Clean farming, as Mr. Leopold says, is the main destructive agency in the decrease of game birds, but if the farmer is to allow Quail cover to grow up on the farm he must be directly compensated for the labor and sacrifices which it involves. Our author contends that the average expense of the hunter in license fees etc., show that he could well afford compensation to the land owner for game production, while the average citizen should help to carry on the cost of conservation as a public welfare activity.

While this is perfectly logical it may be a difficult thing to persuade conservationists to assist in the production of game for hunters to kill. That public funds might be used for the purpose as they now are in restocking with imported or bred birds is much more probable.

Mr. Leopold shows that grazing in wood lots is a serious detriment to game birds as it destroys their cover and calls attention to further complications involved in the discussion, when he cites the farmer's loss of interest in his wood lots owing to his use of oil instead of wood for fuel,

while the destruction of injurious insects, encouraged by the entomological bureaus, demands the clearing up of all brush.

Mr. Leopold is very logical in his discussion of birds of prey and predators. He says that it is foolish to kill Crows in their winter roosts in order to protect nests and young where Crows are migratory since the Crows leave the neighborhood for elsewhere long before nests are built.

It is interesting to note that this investigation and that of Mr. Stoddard in the Southeast are in substantial agreement on the history of the Bobwhite although they approach the subject from different angles and treat of quite different regions, Mr. Stoddard dealing with a poorly cultivated area available for reservations and breeding farms, and Mr. Leopold largely with a high grade agricultural area where successful farmers have to be dealt with.

In the chapter on Wild-fowl we are sorry to read that in all but one or two duck clubs studied, the Federal limit of 25[1] rather than the state limit of 15 is observed and Mr. Leopold "gathered that the practise met with the acquiescence on the part of both State and Federal wardens!"

Mr. Leopold certainly deserves great credit for the mass of data that he has brought together and which must be considered by both gunners and conservationists if game is to be saved from extermination. We only regret that lack of space prevents us from placing more of the information before our readers.—W. S.

Hornaday's 'Thirty Years War for Wild Life.'—Having in the preceding pages noticed the recent contributions to the game problem by the advocates of Quail raising and restocking, and by the arms manufacturers, we turn to quite a different aspect of the subject as presented by Dr. Hornaday in his 'Thirty Years of War for Wild Life.' Dr. Hornaday has long been the militant advocate of wild life conservation, fighting vigorously for what he considers right and sparing no one who opposes him, and in every campaign for game preservation he has occupied a conspicuous position in the front line of attack.

He opens his book with the statement that it is "a book of pertinent facts and useful history. Many of its records are of the ugly and disagreeable kind that our opponents carefully do not print, . . . some of our logical conclusions are just as ugly and disagreeable as the game slaughter conditions on which they are based." He attributes the decrease in game birds to the increase in gunners, of which there are in the United States today 7,500,000, the equivalent of an army of 7500 regiments of full strength. Of these 6,493,454 are legally licensed while about 1,500,000 hunt legally on their own lands or are hunting illegally. His remedy is still lower bags and shorter seasons and throughout he voices an urgent appeal for the passage of the McNary-Haugen bill to reduce the season to eight weeks with no shooting on baited waters.

He continues his campaign against the pump gun and urges that no

[1] Lately reduced to 15 for next season.

gun be sold carrying more than two cartridges, which is the only "gentleman's weapon," a claim backed by many organizations including the Winchester Arms Manufacturing Co., and the State of Pennsylvania. He also contends that no individual gunner should be allowed to hunt more than every other year. He does not believe in the possibility of restocking and says: "after thirty years of intensive work I am convinced that all breeding and 'educational work' done thus far has not saved the game, that no easy-going 'education' ever will save it, that nothing but a combination of drastic laws and big-stick enforcement (plus other salvage measures) ever will achieve good or great results." He also deplores the introduction and rearing of alien birds to replace our own species. The establishment of game refuges requires years as do also investigations of the subject and he adds "what can happen to the remnants of game with 7,500,000 hunters going out after them annually? Who is there who will guarantee a remainder five years hence? Think it over!"

He shows the failure of the bag limit, alone, in maintaining the supply of Quail and the definite increase in these birds in Ohio since they have been protected there at all times.

Dr. Hornaday sets forth in detail the disgraceful political influence present in almost every effort for game legislation and the attitude of the U. S. Biological Survey, the National Association of Audubon Societies and certain sportsmen's organizations which according to his statements in several important crises were not acting in the interests of conservation.

Everyone interested in game birds should read this book and gain a knowledge of the complications which beset every move in the conservation program and the powerful influences which have to be met. That there are legitimate differences of opinion on some of the questions raised by Dr. Hornaday must be admitted. He, for instance, while deploring the importation of foreign game birds, is strong in his praise of the Starling, yet in Great Britain where the bird is better known it is regarded as a pest by those best qualified to judge. In the experience of the reviewer, while it does devour the larvae of the Japanese beetle, our own Grackles and Robins are equally efficient but are being crowded out by the increasing hordes of the foreigners which eat everything in sight and deplete the winter food of many of our native species.

Dr. Hornaday's book[1] is full of tables and diagrams which deserve careful study as well as many portraits of those who have been most active in the defense of our wild life.—W. S.

Williams on Trinidad Birds.[2]—When passing through Trinidad sometime ago the reviewer had the good fortune to come into possession of a

[1] Thirty Years War for Wild Life. Gains and Losses in the Thankless Task. By William T. Hornaday. Published for the Permanent Wild Life Protection Fund by Charles Scribners' Sons. New York—London, 1931, pp. i–xiii + 1–292. Price $2.50.

[2] Williams, C. B. Trinidad Birds. Notes on the Food and Habits of Some Trinidad Birds. Bulletin of the Department of Agriculture, Trinidad and Tobago, Vol. XX, 1922, pp. 123–185.

paper by Mr. Williams which, although nine years old, has apparently never been noticed by the ornithological journals. Because of this fact, and the additional one that the paper is published in a rather obscure serial that is not likely to fall under the eye of the ornithologist, it seems desirable to make some mention of it even at this late date.

The paper had its conception in investigations conducted by Mr. Williams, in his official capacity as Sugar Cane Entomologist, to determine the bird enemies of the sugar cane froghopper. As a contribution to food habits literature, however, it is disappointing, (1) because far too few stomachs were examined (only one to three specimens of a species, as a rule) to obtain any idea of the normal food of any given species, and (2) because the stomach contents of the specimens that were collected are analyzed in only the most general terms. This may be a little unfair, for it is manifestly impossible to make scientific examinations of the contents of bird stomachs without a well-equipped laboratory, adequate reference collections, and a staff of experts especially trained for the work; but that very fact renders it futile to shoot a few dozen birds—of almost as many species—to determine their economic status. Mr. Williams thus examines forty-nine species, but he is himself keenly aware of the inadequacy of the results.

Altogether 101 species are considered, about a third of the total avifauna, and of these, nesting data are given for thirty-nine. This is a very valuable feature of the paper, and it is to be regretted that the author has not in all cases given a complete description of the nest. He has, however, listed all of the nests, with the dates and sites, that have come under his observation. A record of nine eggs in the nest of a House Wren is astounding, but as a Cowbird was seen to enter this nest it may be assumed that all was not as it should have been.

For one who finds an intrinsic interest in local names that does not always attach to the half-breed Latin monikers so often inflicted upon helpless birds, there will be food for thought in Mr. Williams' paper. "The Parson," as a name for *Tachyphonus rufus* is understandable, even appropriate, but why should such an exquisite creature as *Tangara desmaresti* be dubbed "Worthless"? And by what quirk of fancy was "God Bird" ever conceived as a name for that consummate rascal, the House Wren? It is a pity that Mr. Williams does not enlighten us.

The author contributes a note also on that much-mooted question as to whether Vultures find their food by sight or smell. In the Naparimas he observed large numbers of Black Vultures and one or two Turkey Vultures "collected on and around a field . . . which had been experimentally manured with liquid slaughter-house refuse which, though invisible, could be smelled a quarter of a mile away."

Another item of exceptional interest relates to the flocking and migrating of *Muscivora tyrannus*. Imagine flocks of sixty thousand Fork-tailed Flycatchers!

But withal the best part of the report is that—some four and a half pages—devoted to the Guacharo, and this alone amply justifies its publication.—E. G. H.

Nichols' 'Birds of Marsh and Mere.'—In 1926 under the above title Mr. J. C. M. Nichols published an attractive little volume dealing mainly with British game birds and more recently a second edition has appeared.[1] It is a book that will please all lovers of sport, especially duck hunters to which subject it is mainly devoted. Beginning with the Geese—the Gray Lag, White-fronted, Bean and Pink-footed, with the "Black Geese," Bernicle and Brant—we have interesting accounts of their habits and their shooting, interspersed with anecdotes and personal experiences which will appeal strongly to the sportsman. Following are detailed accounts of blinds, guns, and ammunition as used in England.

Then the Ducks are considered and there are chapters on 'Shooting in Canada,' the 'Larger Wading birds and Shorebird Shooting,' the latter a sport no longer permissible in America.

It is interesting to read of the abundance of the European Widgeon and of the occasional capture of an American Widgeon, just the reverse of conditions on our own coasts, but the mention of the regular migration of the Trumpeter Swans in Canada must surely be a slip of the pen for the Whistling Swan, a species which is not mentioned.

The author's statement that Geese feed in the fields on moonlight nights just as they do in the daylight and his theory that they resort to the shore the next day "for salt and sand to help digest their meal" is interesting though perhaps the theory is not proven. The book is full of such little bits of fact and theory on the habits of the birds which add much to its interest.

Mr. Nichols, by the way, is not only author but artist as well and has furnished a lot of line sketches and excellent wash or pencil drawings mainly of birds on the wing, reproduced in half-tone as well as a color plate of the White-fronted Goose.—W. S.

Wetmore's 'The Birds of Haiti and the Dominican Republic.'—As is generally known Dr. Alexander Wetmore has for some time been interested in the bird life of Haiti and San Domingo and the results of his explorations in the island and his studies of its avifauna have just been published as a Bulletin of the U. S. National Museum.[2]

This report owes its inception to the researches of Dr. William L. Abbott who in 1883 and again from 1916 to 1923 made extensive collections on the

[1] Birds of Marsh and Mere and how to Shoot them. By J. C. M. Nichols, with an Introductory Note by J. G. Millais. Illustrated by the Author. Heath Cranton, Limited. 6 Fleet Lane, London, E. C. 4. Pp. 1–287. Price 7 shillings, 6 pence net., postage 6 pence extra.

[2] The Birds of Haiti and the Dominican Republic. By Alexander Wetmore and Bradshaw H. Swales. Bulletin 155 U. S. National Museum, U. S. Government Printing Office. Washington: 1931. Pp. 1–483, pll. 1–26. (For sale by the Supt. of Documents, Washington, D. C., Price $1.00.)

island and its adjacent islets, the first collection being presented to the Academy of Natural Sciences of Philadelphia and those obtained on the later trips to the U. S. National Museum. These latter were partly worked over for publication by the late Bradshaw H. Swales and his name appears as joint author of the present volume.

In addition to the notes accompanying the collections of Dr. Abbott and Dr. Wetmore, upon which the report is mainly based, all previous literature has been studied and the collections in the museums at Cambridge, New York, Philadelphia, and Chicago have been examined so that the report becomes in reality a monograph of the avifauna of this most interesting island. The discovery by Dr. Abbott of such unlooked for birds as *Brachyspiza* and *Loxia* in the interior of Haiti attracted not a little attention to this region and several ornithologists were led to visit it, notably James Bond who made investigations in the interest of the Philadelphia Academy with excellent results, those of his last trip being published too late to be included in this work.

In form Dr. Wetmore's report is a model for such publications. The account of each species begins with a list of vernacular names and a full synonymy of papers relative to its occurrence on the island, followed by an extended account of its life history and a list of recorded localities where it has been found. Of especial interest is the inclusion of the fossil birds described from the bone deposits in the caves of the island.

There is, too, an interesting historical introduction with an account of the physical features of the island with lists of the characteristic birds of the several regions as well as of transients and winter visitants from North America.

Many illustrations from photographs give a good idea of the several habitats while some half-tones from paintings by Allan Brooks depict several of the most interesting birds. While there is a table of contents and an excellent bibliography there is no list of plates although such a list would be a desirable addition to these 'Bulletins.'

Dr. Wetmore is to be congratulated upon an admirable piece of work and a worthy successor to his 'Birds of Porto Rico.'—W. S.

Mrs. Nice's 'Birds of Oklahoma.'—We have come to regard Mrs. Nice as our authority on the birds of Oklahoma and now that her "habitat" has been moved eastward to Ohio it is gratifying to have her observations covering over ten years of intensive study placed on permanent record.

The report[1] opens with an interesting historical review of Oklahoma ornithology beginning with the accounts of Edwin James, a member of Major Long's Expedition of 1820, when Paroquets, Egrets, and Ivory-billed Woodpeckers were present in abundance. The physical features of the state are then considered with a general account of the bird life. We

[1] The Birds of Oklahoma. Revised Edition. By Margaret Morse Nice. Vol. III, Biological Survey, No. 1, Publ. Univ. Oklahoma. Norman, Univ. Oklahoma Press, 1931. Pp. 1–224.

learn that the fauna of the eastern half is exclusively eastern in its character, that of the central area showing a decrease in eastern elements but with few really western forms, while at the extreme end of the "Panhandle" western birds predominate. Of the entire list 50% of the breeding species are eastern forms, 28% western, 8% middle western and 15% widely distributed species.

There is a good bibliography and an excellent annotated list of itineraries and reports on field work in Oklahoma, many of them manuscripts. A page is devoted to attracting and protecting birds, and there is an account of migration in the state and a series of Christmas censuses.

The list proper which comprises most of the report is excellently prepared with full annotations as to abundance, character of occurrence, habitats, etc., with migration and nesting dates, definite records of occurrence of the rarer species, and a brief summary of food.

Several outline maps and four half-tone plates constitute the illustrations. The nomenclature is that of the forthcoming A. O. U. 'Check-List,' with the original numbers placed at the front of the names. While these numbers are preserved in the new Check-List (at the end of the names) for the benefit of oölogists, who depend upon them for the identification of eggs, they seem to serve no purpose in a faunal list such as the present, especially as the new classification throws them completely out of sequence.

Mrs. Nice deserves the thanks of all ornithologists, especially those of the Middle West for her excellent report which will long be our standard authority on the birds of the state.—W. S.

Spiker's Birds of Peterboro Swamp and Labrador Pond, N. Y.—A recent 'Bulletin'[1] of the Roosevelt Wild Life Forest Experiment Station consists of a "Biological Reconnaissance of the Peterboro Swamp and the Labrador Pond Areas," in Madison Co., N. Y., with the object of determining their suitability as permanent game refuges which might serve as a reservoir for the maintenance of small game and its spread into adjoining territory.

The report has been prepared by Charles J. Spicer and follows the excellent plan of previous publications of the same kind issued by the Experiment Station. The general character of each area is described with photographs illustrating the various habitats; then follows a summary of the present mammal and bird faunas with notes on each species, and finally a consideration of the game species, their present, past, and probable future—if the area is preserved. The birds observed during the several visits of the author to the Peterboro Swamp numbered 114 with 107 for the Labrador Pond area.

There is also presented an excellent consideration of the economic value of birds and of the control of raptors and rodents. While the author finds

[1] A Biological Reconnaissance of the Peterboro Swamp and the Labrador Pond Areas. By Chas. J. Spiker. Roosevelt Wild Life Bulletin, Vol. 6, No. 1, March 19, 1931. Pp. 1–151.

that Goshawks and Cooper's Hawks need a measure of control he finds no evidence of depredations by the Snowy Owl during its phenomenal incursion in 1927–8 and places the Great Horned Owl "on the fence" as it does much good. The control of these species as well as of the Crow he says should be governed by local conditions and not by a state-wide law. Unfortunately, as shown by illustrations, taxidermists handled large numbers of both these Owls killed (within the law) for trophies without any regard to economic considerations.

An excellent color plate of winter birds by E. J. Sawyer is a valuable addition to the other illustrations.

Mr. Spiker has produced a good and reliable piece of work and we trust framers of economic legislation in New York will carefully consider his conclusions.—W. S.

Hachisuka's 'Birds of the Philippine Islands.'—We have received the first volume[1] of a comprehensive work on the birds of the Philippines (in English) by Hon. Masauji Hachisuka.

This volume "Part I" contains first, an account of the geography and climate of the archipelago with a map illustrating the rainfall; second, an ornithological history of the Philippines containing excellent summaries of the work of all who have studied the bird life, arranged chronologically with lists of the new species described, and third, a detailed account of the author's explorations in Mindanao and those of his colleague Mr. Nahamura. Then there follows a bibliography of Philippine ornithology and the systematic account of the avifauna, of which the present volume contains only the Megapodes and Pheasants. There are numerous excellent plates mainly from photographs of scenery, natives, camps of the author's expeditions, etc., and several plates of birds from drawings or published pictures, with a frontispiece in colors of the Palawan Peacock Pheasant from a painting by Grönvold.

The work is admirably prepared and beautifully printed in royal octavo size (10 × 7½ ins.), and we shall look forward with interest to the appearance of the succeeding parts.—W. S.

van Rossem on Sonoran Birds.—Nearly 4000 bird skins from Sonora, mainly collected by J. T. Wright for Mr. Griffing Bancroft, and now incorporated in the Dickey collection at the California Institute of Technology, have been studied by Mr. van Rossem and a number of new forms described from time to time. The present paper[2] is a report upon the entire land bird material (the water birds to be reported upon by Mr. Bancroft), and constitutes one of the most important contributions that has been

[1] The Birds of the Philippine Islands with notes on the Mammal Fauna. By The Hon. Masauji Hachisuka F.Z.S., F.R.G.S. (etc.). Part I. Pages 1–168. H. F. & G. Witherby, 326 High Holborn, London, W. C. 1. March 16, 1931.

[2] Report on a Collection of Land Birds from Sonora. By A. J. van Rossem. Trans. San Diego Soc. Nat. Hist., VI, No. 19, pp. 237–304 with map. April 30, 1931.

made to the ornithology of Mexico for some years. Four faunal districts of northwestern Mexico are recognized by Mr. van Rossem as follows; (1) the Colorado Desert District of the northwest; (2) the southern extension of the "Eastern Plains Area" of Swarth, which, like the former, extends well into Arizona and also takes in a part of New Mexico; (3) the southern Alamos District including parts of Chihuahua and Sinaloa, and (4) Tiburon and Esteban Islands.

All of the specimens of each form are listed with localities and dates and there is much valuable discussion of relationships. It is to be regretted that the paper did not appear in time to be utilized in the forthcoming A. O. U. 'Check-List' as it throws much light upon several problems upon which the Committee was poorly informed. We congratulate Mr. van Rossem upon an admirable piece of work.—W. S.

Ten Year Index to 'The Condor.'—On April 15 last, appeared the third ten-year index[1] to 'The Condor' covering the period 1919–1928, the compilation being the work of Mr. George Willett. It follows closely the general plan of the preceding index but with several improvements, notably the indexing of all specific names independently as well as under their genera. These ten-year indexes to both 'Auk' and 'Condor' are simply indispensible to anyone seeking ornithological information, as they serve as the key to unlock the storehouse of information contained in these journals, most of which would otherwise be inaccessible. Everyone who owns a set of 'The Condor' must have this as well as the two preceding indexes.

Mr. Willett deserves the thanks of all 'Condor' readers and of ornithologists in general for his painstaking work. Only those who have prepared such an index know the amount of labor that it involves!—W. S.

Bowen on Birds of East Africa.—Mr. Prentiss N. Gray made a trip through British East Africa and Angola in 1929 in the interests of the Academy of Natural Sciences of Philadelphia and included in his party Mr. W. Wedgwood Bowen, now assistant curator of birds in that institution, as ornithologist. A collection of 596 specimens of birds was obtained in the former region which has been reported upon by Mr. Bowen in the present publication,[2] while an account of the Angola collection will follow. In the present annotated list 225 species are included; the specimens of each are enumerated, with field notes, discussions of plumages and, in many instances, notes on nests and eggs. In several cases the relationships of various allied forms are discussed. All new forms obtained have been published in advance and notices of these papers have already appeared in these columns.

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[1] Third Ten Year Index to The Condor, 1919–1928. By George Willett. Pacific Coast Avifauna, Number 20, Cooper Ornithological Club, Berkeley, California. April 15, 1931, pp. 1–152. Price $4.00, apply to W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Los Angeles, California.

[2] East African Birds Collected During the Gray African Expedition—1929. By W. Wedgwood Bowen. Proc. Acad. Nat. Sci. Phila., LXXXIII, pp. 11–79, May 27, 1931.

Collecting was carried on mainly at Meru in Kenya Colony and in the Ikoma region in Tanganyika Territory but some specimens were obtained at Mombasa and at additional localities in Kenya.

The most interesting feature of the Tanganyika trip, which covered June and July, was the breeding of many of the species encountered. A colored plate of the Kingfisher, *Halcyon albiventris prentissgrayi* Bowen, from a painting by Earl L. Poole forms a frontispiece to the paper.

Mr. Bowen has made a valuable and welcome contribution to our knowledge of the avifauna of this interesting region. As this issue is going through the press, Mr.Bowen's report on the Angola collection[1] has appeared. It opens with a description of the country with a cross section map showing the elevation of the collecting stations, and lists of the species arranged in accordance with breeding activities (in September and October). Then follows the excellent annotated list of 124 species, with a number of photographs illustrating the various habitats and nests and young of several species.—W. S.

'Cope: Master Naturalist.'—One of the most interesting biographies that we have read is Professor Osborn's life of Edward D. Cope,[2] interesting not only from the close association of subject and biographer, but from the fact that it is based so largely upon Cope's own letters, especially to members of his family, which shed so much light upon Cope, the man, a side that was little known to those who came in contact only with Cope, the naturalist. These letters, more even than the astonishing bibliography which closes the volume, show the wonderful breadth of knowledge that he possessed and the ability to write entertainingly or comment intelligently upon any subject—sociology, suffrage, art or music as well as science in practically all of its branches.

Professor Osborn has handled the biography very skillfully. He opens with a chapter on the "Pioneers of Palaeontology in America," then follow five chapters in which Cope's life and activities are treated chronologically. Next a chapter on "How Cope earned the title of Master Naturalist" in which are reviewed his contributions to no less than ten branches of science, in at least five of which he stood in the front rank—Palaeontology, Mammology, Icthyology, Herpetology and the Theory of Evolution. Professor Osborn's 'Personal Reminiscences' and the Bibliography of some 150 pages complete the volume.

While Cope was not, as it happened, an ornithologist he might well

[1] Angolan Birds Collected During the Gray African Expedition, 1929. By W. Wedgwood Bowen. Proc. Acad. Nat. Sci. Phila., LXXXIII, 1931, pp. 263–299.

[2] Cope: Master Naturalist. The Life and Letters of Edward Drinker Cope. with a bibliography of his writings classified by subjects. A study of the Pioneer and Foundation Periods of Vertebrate Palaeontology in America. By Henry Fairfield Osborn, with the coöperation of Helen Ann Warren. Illustrated with Drawings and Restorations by Charles R. Knight under the Direction of Professor Cope. Princeton University Press, Princeton, New Jersey. London: Humphrey Milford, Oxford University Press. MCMXXXI, Pp. i–ix + 1–740, figs. 1–30.

have been one, had not other fields of research so fully and constantly occupied his comparatively short life, for he was but fifty-seven at the time of his death, and even on his death bed was striving to complete his paper on the Port Kennedy bone deposits. Extracts from his early letters show a thorough knowledge of local birds and his knowledge of other genera was greater than that of the proof-readers of the biography as his mention of the song of *Myadestes*, in the Mexican mountains appears as "*Hyladistes*." The reviewer can testify as a result of many conversations with Cope to a far greater knowledge of birds than appears from his writings, and once after looking over a collection of birds and commenting on their taxonomy he remarked "What you want are alcoholic specimens; then you can get at their proper relationships" and added with a smile "some day, perhaps, I shall get at the birds and straighten them all out." It is regrettable that he did not do so as the master mind with its uncanny ability to detect relationships and unravel the tangled scheme of taxonomy would have given ornithologists food for thought. Perhaps the collection of alcoholic birds obtained for him in Brazil by H. H. Smith and which he bequeathed to the Philadelphia Academy was acquired for some such purpose. In this connection it may be interesting to add to Professor Osborn's explanation of the frontispiece picture of Cope in his study, that the stuffed cat on the desk is a unique specimen of *Felis* obtained by Smith and described by Cope in 1889.

Everyone at all interested in science should read this fascinating and inspiring volume.—W. S.

Schiöler's Birds of Denmark.—In 'The Auk' for April, 1926, the first volume of this sumptuous work was reviewed at length, since its many interesting notes from Greenland gave it a particular value for students of the Arctic-American birds. Of the eight volumes originally planned, the second only had appeared (in 1926) when its author died, August 13, 1929, leaving, however, the material for the third nearly ready for publication. This volume is now issued,[1] and happily, the publishers announce that not only have plans been made for the continuation of the work, but that through help of a state grant, Schiöler's magnificent collection of birds has been secured for the museum at Kopenhagen.

Vol. 2 (1926) opens with two chapters specially devoted to the ornithology of Greenland, the first briefly reviewing the literature before and since Winge's list, the second giving a revised summary of the known avifauna of that country, together with an excellent map. It appears that in all, 168 species and subspecies are definitely recorded from Greenland of which some 62 are known to breed, among them three whose nesting in

[1] Danmarks Fugle med Henblik paa de i Grönland, paa Faeröerne og i Kongeriget Island forekommende Arter. By E. Lehn Schiöler. Bind II. Oversigt over Grönlands Fugle og Andefugle (Anseriformes) II. Dykaender (Fuligulinae). 1926. 37.5 × 28 cm., pp. 1–338, pll. 1–86, map. Bind III. Rovfugle (Falconiformes). 1931. pp. 1–413, pll. 1–91. Gyldendalske Boghandel, Köbenhavn.

Greenland has only recently been established, namely, *Erolia bairdii*, *Anthus pratensis*, and *Motacilla alba alba*. Of the many stragglers that reach Greenland, it is noteworthy that most of the American species are recorded from West Greenland, and the European from East Greenland. Thus all of the 14 American Warblers are west-coast records, most of them single occurrences only. Schiöler has made a minute study of representative series of northern birds and as a result has recognized many local subspecies that workers with less extensive material might not; thus he regards the Longspur and the Snow Bunting as recognizable races, reviving for them Brehm's names, *Calcarius lapponicus groenlandicus* and *Plectrophenax nivalis subnivalis* respectively; he has also described the Greenland Merganser as *Mergus serrator major* and figures the slightly different bills. The Addenda at the end of the volume give a number of more recent notes. The main part of the volume completes the treatment of the Anseriformes, the Fuligulinae and Merginae, the various plumages and changes of which are illustrated by the colored plates. It must be admitted, however, that the small size of the figures and the four-color process used do not in all cases give quite satisfactory results.

Volume 3 (1931) covers the Falconiformes and is in some ways a distinct improvement over the previous volumes in the matter of illustrations. Fourteen genera with 39 species and subspecies are included. The same thorough treatment, species by species, is continued, with first a chapter on the structure of the group and a summary in parallel columns of the forty points in skull, trunk, limbs and girdles that distinguish the two families recognized as occurring in Denmark, the Aquilidae and the Falconidae. The many colored plates by H. Scheel and G. Heilmann are notable for the thorough manner in which the various stages and variations of plumage are illustrated. Thus there are no less than twenty good-sized figures of *Accipiter nisus*, nine of *Circus aeruginosus*, six of the Golden Eagle, while the Gyrfalcons are shown by no less than thirty colored figures of the five races which the work recognizes, namely *Falco rusticolus rusticolus* a fall and winter visitor in Denmark, *F. r. islandus* the breeding bird of Iceland, straggling to Greenland, *F. r. obsoletus* the Labrador form, rarely reaching that country, *F. r. holboelli* the breeding bird of southern and *F. r. candicans* that of eastern and northwestern Greenland!

The Ospreys are regarded as members of the Aquilidae and two records for the American race are included, both from Greenland, based on specimens in the Kopenhagen Museum; the American Sparrow Hawk has been once taken in Denmark, a young male shot at Birkendegaard in 1901, and figured in color. There is also given a single record for the Iceland Merlin, *Falco columbarius subaesalon*, from Angmagsalik, east Greenland, July 1914. It is to be hoped that the remaining volumes of this great work may eventually be completed.—Glover M. Allen.

Shorter Papers.

Baldwin, S. Prentiss.—Bird Banding by Systematic Trapping. (*Sci. Publ., Cleveland Mus. Nat. Hist.*, Vol. I, No. 5, pp. 125–168, April 15, 1931).—This is a reprint of a paper presented at the A. O. U. meeting in 1919 which really marked the beginning of systematic bird banding and led to its adoption by the U. S. Biological Survey. The paper was also the instrument through which many of our bird banders were instructed in the principles of the work. There is also a reprint of Mr. Baldwin's article on the 'Marital Relations of the House Wren.' All who desire this important and historic paper may obtain it by applying to the U. S. Biological Survey.

Bowen, W. Wedgwood.—Two New Subspecies of Sudanese Birds. (*Proc. Acad. Nat. Sci., Phila.*, Vol. LXXXIII, pp. 229–231, April 24, 1931.)—*Trachyphonus margaritatus kingi* (p. 229) Erkowit, Red Sea Province, Sudan; *Steganura aucupum kadugliensis* (p. 230) Kadugli, southern Kordofan, Sudan.

Bowen, W. Wedgwood.—The Geographical Forms of *Polihierax semitorquatus*. (*Proc. Acad. Nat. Sci. Phila.*, LXXXIII, pp. 257–262, May 9, 1931.)—A full discussion of the four described forms and the description of *P. s. major* (p. 259) from Mbuyuni, Teita district, Kenya.

Chasen, F. N. and **Kloss, C. Boden.**—A New Race of Cyornis from the Java Sea. (*De Treubia*, Vol. XII, Livr. 3–4, December, 1930.)—*Cyornis rufigastra longipennis* (p. 271).

Chasen, F. N. and **Kloss, C. Boden.**—On a Collection of Birds from the lowlands and islands of North Borneo. (*Bull. Raffles Museum, Singapore*, No. 4, December, 1930, pp. 1–112.)—An annotated list of the collection made by the authors in 1927 from which sixteen new forms have already been described (one of these reduced to synonymy in the present paper). Three additional forms are here described: *Halcyon concreta borneana* (p. 24) Bettotan; *Malacopteron magnum saba* (p. 75) Samawang River, near Sandakan; *Mixornis gularis argentea* (p. 82) Mallewalle Island. Appended to this paper in the same issue of the 'Bulletin' are papers by the same authors on 'A List of Birds of Banguey, Balambangan and Mallewalle Islands, British North Borneo'; 'Birds of Mangalum and Mantanani Islands off the West Coast of British North Borneo'; and 'Additions to the List of Bornean Birds [3 in number].'

Collins, Henry H., Jr.—Field Marks of All Birds Easily Confused, Occurring Annually in Northeastern North America.—The author has attempted a very difficult task, especially as some of the characters are evidently not quoted from personal experience in the field, nevertheless he has recorded a number of points that will aid the amateur in distinguishing closely related species and, as he explains, it is only to be used in conjunction

with some standard manual. We might suggest that the Rough-winged Swallow, which he finds difficult to tell from the Bank and young Tree Swallows in autumn, may easily be determined by the strong rusty edgings to the tertials. Mr. Collins's little pamphlet may be secured from him at 7950 Ardmore Ave., Chestnut Hill, Philadelphia. Price 50 cents.

Darlington, P. J., Jr.—Notes on the Birds of Rio Frio (near Santa Marta) Colombia. (*Bull. Mus. Comp. Zool.*, LXXI, No. 6, pp. 349–421, March, 1931.)—An annotated list of 237 species or subspecies, of which 21 are additions to Todd and Carriker's 'Birds of the Santa Marta Region.' Much interesting information is presented in the paper dealing with the habits of the species and their relationship. *Sapphironia* (*Lepidopyga duchassaingi* was collected at Sevillano and it is suggested that the blue-bellied bird, *L. lilliae*, which was seen but not secured, is identical with this species possibly a plumage assumed by very old individuals. *Porzana flaviventer bangsi* (p. 372) from Cienaga is described as new.

Dickey, Donald R.—A New Clapper Rail from Sonora. (*Trans. San Diego Soc. Nat. Hist.*, VI, No. 18, pp. 235–236.)—*Rallus obsoletus rhizophorae* (p. 235) Tobari Bay.

Friedmann, Herbert.—Birds Collected in the Belgian Congo. (*Report Harvard African Expedition*, pp. 749–768.)—An annotated list of birds collected by two members of the Harvard expedition, Loring Whitman and Dr. D. H. Linder.

Friedmann, Herbert.—Social Parasitism in Birds. (*Smithsonian Report for 1929.*)—Reprinted from the Quarterly Review of Biology, December, 1928.

Hartert, Ernst.—Types of Birds in Tring Museum. (*Novitates Zool.*, XXXVI, pp. 184–190, April, 1931.)—This installment continues the study of Mathew's types of Australian birds—the Terns, Petrels and Albatrosses, and in the author's opinion 26 of the 34 forms listed, must be reduced to synonymy although three are so relegated with a query.

Huey, Laurence M.—On the Marsh Sparrows of Southern and Lower California. (*Trans. San Diego Soc. Nat. Hist.*, VI, No. 10, pp. 203–206, Aug. 30, 1931.)—*Passerculus beldingi* is regarded as a subspecies of *P. rostratus*, the other forms being *rostratus*, *guttatus* and *halophilus* and a new race described as *P. r. anulus* (p. 204) from Scammon Lagoon. Mr. Huey also describes two other Lower Californian birds in the same journal: *Auriparus flaviceps ignatius* (p. 211) San Ignacio (VI, No. 13, September 30, 1930) and *Amphiza belli xerophilus* (p. 229) Santa Catarina Landing (VI, No. 16, December 24, 1930).

Kloss, C. Boden.—An Account of the Bornean Birds in the Zoological Museum, Buitenzorg, with the Description of a New Race. (*De Treubia*,

XII, Lifr. 3–4, December, 1931, pp. 395–424.)—*Alophoixus phaeocephalus medius* (p. 412), Long Petah, E. Borneo.

McAtee, W. L.—Local Bird Refuges. (*Farmers' Bulletin*, No. 1644, U. S. Dept. Agric.)—Valuable information on food plants, fountains, etc.

Mayr, Ernst.—Birds Collected During the Whitney South Sea Expedition XII. (*Amer. Mus. Novitates*, No. 469, March 31, 1931.)—Notes on *Halcyon c. chloris* and some of its subspecies. Eight new races described.

Metcalf, Franklin P.—Wild-Duck Foods of North Dakota Lakes. (*Technical Bull. No. 221 U. S. Dept. Agriculture*, March, 1931, pp. 1–70).—An extremely detailed report on the North Dakota lakes with lists of the vegetation of their vicinity from surveys made by two former members of the Biological Survey but rather belated since the field work was done in 1917!

Rapp, F. W.—Bird List of Vicksburg, Michigan. Pp. 1–35, Price 35 cents.—An Annotated list of 139 species with statements of abundance, dates of arrival and departure and nesting dates. The migration dates are extremes. Would not average dates prove of more value to the student?

Rothschild, Lord.—On a Collection of Birds made by Mr. F. Shaw Mayer in the Weyland Mountains, Dutch New Guinea, in 1930. (*Novitates Zool.*, XXXVI, pp. 250–276, April, 1931.)—Eight new forms described.

Rothschild, Lord.—A Preliminary Review of the Mooruk (*papuanus bennetti*) Group of Cassowaries. (*Novitates Zool.*, XXXVI, pp. 181–183, April, 1931.)—The thirteen described forms, the author would now arrange in six species, *papuanus*, *bennetti*, and *westermanni* having three races each, *keyseri* two, and *loriae* and *roseigularis* remaining monotypic. There are beautiful color plates of the head of *C. p. rogersi* (living) as it appeared in 1928 and in 1930.

Sawyer, E. J.—Bird Houses, How to Make them and Where to Place them. Bulletin No. 1, Cranbrook Institute of Science, Bloomfield Hills, Mich. Fully illustrated, with special information for each species.

Skovgard, P.—Sobre las Emigraciones de las Aves. (*Conferencias y Resenas Cientif. de la Real Soc. Espanola de Hist. Nat.*, I, Num. 3–4., Madrid, 1930.)—An interesting summary of banded birds recovered in Spain and a résumé of captures in various parts of the world of birds banded in Iceland. [In Spanish.]

Sutton, George M.—A Year at Southampton Island. (*Carnegie Magazine, Pittsburgh, Pa.*, IV, No. 9.)—An interesting account of his recent sojourn in the far north.

Van Oort, E. D.—Results of Bird Banding at the Natural History Muesum at Leiden. (*Zool. Mededeelingen Mus. Nat. Hist. Leiden*, XIII, Afl. 3–4, 1930.) [In Dutch.]

Wetmore, Alexander.—The Avifauna of the Pleistocene in Florida. (*Smithson. Misc. Coll.*, Vol. 85, No. 2, April 13, 1931, pp. 1–41.)—This is an important contribution to ornithological palaeontology covering collections made from the Anastasia formation on both the east and west coasts of Florida. No less than 65 forms of birds have been identified of which 53 are living in Florida today, while nine others are recent species but are not now found in Florida—among which are the Whooping Crane, Trumpeter Swan, and California Vulture, together with the tropical Jabiru and species of *Geranoaetus* and *Aramides*. Three are exclusively fossil species a Teal and a Turkey, and the curious *Teratornis merriami*, hitherto known only from the Rancho La Brea beds of California. Curiously enough there is a total absence of Shore-birds and Gulls and Terns, the same being true of the Pleistocene deposits of California.

Wilson, Gordon.—Alexander Wilson, Poet—Essayist—Ornithologist. (*Abstract of a Thesis presented for the degree of Doctor of Philosophy at Indiana University.*)—It is to be hoped that Mr. Wilson's thesis may be published in full as it must contain much original matter to judge from his brief statements that "this study is the first to summarize Wilson's achievements in both literature and science and to show that the characteristics for which he became noted in mature life were already evident long before he left Scotland." The author has also discovered "much biographical matter in his poems, etc., previously overlooked and many letters not known to the early biographers."

The Ornithological Journals.

Bird-Lore. XXXIII, No. 2. March–April, 1931.

The Trogons of Barro Colorado. By Frank M. Chapman.—Experiences with the four species occurring on the island. Trogons we learn are usually seen from below so that it is the colors of their under parts and of the under side of the tail that constitute their best field marks.

An Uncommon Michigan Sparrow. By Frank N. Wilson.—Breeding of the Lark Sparrow, with excellent photographs.

The Mating Flight of the Woodcock. By George Wallace.—The author "is convinced" that the Woodcock flaps his wings alternately "the method one so often observes in the Chimney Swift." While we are aware of the apparent alternate flapping of the Swift as it appears to some, we know of no definite proof of such action and have personally never seen it.

Leo the Owl. By William A. Paff.—An account of a Long-eared Owl.

The Short-billed Marsh Wren. By Fred. J. Rogers.—Breeding at Winnipeg.

Dr. A. A. Allen has an interesting article on the House Sparrow written as if by the Sparrow himself.

The Color plate represents the Coppery-tailed Trogon.

The Condor. XXXIII, No. 2. March–April, 1931.

The Breeding Limicolae of Utah. By L. R. Wolfe.—An excellent illustrated article covering nine species.

Some Notes on Young Desert Horned Larks. By Leon Kelso.—A contribution to the life-history of *Otocoris alpestris leucolaema*.

Further Notes on California Brown Pelicans at Point Lobos, California. By Laidlaw Williams.

Bird Remains from the Kern River Pliocene of California. By Loye Miller.—With description of *Vultur kernensis* (p. 70) a form of King Vulture.

The Condor. XXXIII, No. 3. May–June, 1931.

Notes on the Habits and Development of Young Quail [*Lophortyx. c. californica*]. By Frank F. Gander.

Some Observations on Bird Behavior. By E. L. Sumner, Jr.—Play of the Marsh Hawk; escape of young Black-necked Stilts and opposition of a Texas Nighthawk to intrusion.

Facts Concerning the Use of Thallium in California to Poison Rodents. By Jean M. Linsdale.—(cf. Notes and News of this issue of 'The Auk.')

Two Primitive Rails from the Eocene of Colorado and Wyoming. By Alexander Wetmore. *Eocrex primus* (p. 107) and *Palaeorallus troxelli* (p. 108) are described.

The Birds of Rogue River Valley, Oregon. By Ira N. Gabrielson.

The Wilson Bulletin. XLIII, No. 1, March, 1931.

Nesting of the Duck Hawk in Tennessee. By Albert F. Ganier.

A Preliminary Report of the Influence of Light Intensity upon the Time of Ending of the Evening Song of the Robin and Mockingbird. By Jesse M. Shaver and Miss Ruby Walker.—The authors found that light intensity was probably the main cause of song ending.

The Soaring of Raptorial Birds. By R. H. Palmer.

Quartering Flight in Migration. By E. C. Hoffman.

Control of Insects by Birds. By W. L. McAtee.—Reply to a paper in the last issue.

Migration of Canada Geese from the Jack Miner Sanctuary and Banding Operations. By Manly F. Miner.

Notes on the Breeding Birds of State College, Center County, Pa. By Thomas D. Burleigh.

Bird Banding. II, No. 2. April. 1931.

Bird Distribution and Bird-banding. By Herbert Friedmann.—A very suggestive article. The author, himself curator of one of the largest collections of bird skins in the world, on behalf of the study of live birds, says:

"the possibility of culling significant data from such sources [i. e. skins] depends largely on the acumen and imagination of the individual worker, but also on the quantity and kind of facts, theories, and generalizations supplied to him by the total sum of recorded knowledge of living birds."

Some Returns and Recoveries of the Black Skimmer. By John A. Gillespie.—A record of 290 birds banded in the New Jersey colonies with recoveries from Cocoa and Hastings, Fla.; Fort Raleigh, N. C.; and Paris Island and Georgetown, S. C.

A Study of the Chickadee, and White-breasted Nuthatch by Means of Marked Individuals. By W. K. Butts. Part three of this admirable article.

The Oölogist. XLVIII, No. 2. February, 1931.

The Distribution of the Limicolae in New Jersey. By L. S. Kohler.—This is a misleading paper because of the author's extremely limited experience. Let the reader compare it with Mr. Urner's list in 'General Notes' of the present 'Auk' and similar lists of his in previous years.

Iowa Bird-Life. I (New Series), No. 1. March, 1931.

This neatly printed little journal, in a new form, is full of notes on the bird life of Iowa.

The Migrant. II, No. 1. March, 1931.

This formerly mimeographed journal now appears in printed form with an attractive cover, and contains much of interest on the birds of Tennessee. It is published by the Tennessee Ornithological Society.

The Heron. No. 1. 1930. Annual of the Woodmere Academy [Long Island, N. Y.] Bird Club.

This is the first publication of an annual "devoted principally to the natural history of southern Nassau County, N. Y." It is beautifully printed and contains much ornithological matter, among the articles we may mention:

The Bird Life of the Lido Flats. By Benjamin C. Berliner.

The Montauk Trip. By Robert Arbib.

The Herons. By Richard Weil.

The Bird Season of 1930. By Robert W. Berliner.—With migration data and records of notable occurrence.

We suspect that the Club owes much of its activity to the guidance and encouragement of one of the School Faculty, David Harrower, a former active member of the Delaware Valley Ornithological Club.

The Ibis. (XIII series) I, No. 2. April, 1931.

The Birds of Northern Nigeria. Part III, Pteroclididae—Picidae. By Major H. P. W. Hutson and David A. Bannerman.—Continuation of this extremely interesting paper. The full annotations constitute veritable life histories of the various species while Mr. Bannerman's systematic notes are of great value.

An Egyptian Sparrow Roost. By R. E. Moreau.—An interesting contribution to the literature of the roosting habit.

The Birds of "L'Ile de la Camargue et la Petite Camargue." By W .E. Glegg.—The aim of this paper is to present a summary of our knowledge of the bird life of this interesting region based upon the published literature, a number of manuscript lists, and the author's personal observations during eight visits to the area.

Some Further Notes on *Aechmorhynchus cancellatus*. By Percy R. Lowe. —The presence of the femoro-caudal muscle indicates that the bird is a "Curlew."

Notes on Birds Observed in Spitsbergen during the Spring of 1930. By C. T. Dalgety, J. H. McNeile and M. J. Ingham.—With beautiful photographs of the nests of various shore-birds.

On Geographical Variation within the Limits of West Africa. By George L. Bates.—The life regions from south to north are: the forest, the savannah, the semi-arid belt, and the desert. Mr. Bates lists the species of these several areas and shows how tone of coloration and size vary geographically. As he truly says it is a waste of time to differentiate and name closely related races unless the work "leads somewhere," and he gives a good illustration of what may be gained from a study of such forms. He calls attention to the fact that there are many variations which have not as yet received names and questions how far it is necessary to give names to forms which vary regularly along parallel lines in the same given area. However, we feel sure that, with no law to prevent it, all such forms will sooner or later be named by some enterprising systematist whether it helps in working out the geographic problem or not!

Olof Rudbeck, Jr. the first Swedish Ornithologist. By Prof. Einar Lönnberg.—Besides an interesting biography there is a discussion of Rudbeck's plates of birds which formed the basis of many Linnaean species. Linnaeus lived in the Rudbeck home as a tutor with full access to the library. Some of Linnaeus' doubtful bird names thus become definitely identifiable and in several cases must apparently supersede those now in use. The Snowy Owl becomes *Nyctea scandiaca* and the Redpoll *Acanthis flammea* while the specific name *gyfralco* instead of applying to a Gyrfalcon is really a Goshawk! Excellent reproductions of several of the plates are presented.

Additions and Corrections to the Synonymy of the Alcedinidae in the "Fauna of British India." By Prof. A. Laubmann.—In correcting the statement that the type of *Megaceryle* Kaup is by subsequent designation of Gray 1855, and not by monotypy, Prof. Laubmann overlooks the fact that Gray did not designate the type of Kaup's genus but *Megaceryle* Reichenbach. The first type designation of Kaup's genus is apparently that of Sharpe, 1871.

Some Birds from Siam and Laos. By the late H. C. Robinson.

With the present volume 'The Ibis' inaugurates a department of "Short

Notes" similar to "General Notes" which for nearly fifty years has proven such a popular feature in 'The Auk.'

Bulletin British Ornithologists' Club. CCC XLVIII March 3, 1931.

There is a discussion of the so-called one letter problem in nomenclature in which Mr. Mathews claims that the recent decision of the International Commission that *Leucochilus* and *Leucochila* are absolute homonyms was a reversal of Article 36 of the Code. The statement that such words already in use were not to be rejected is really a recommendation and not a rule and it has been our understanding that recommendations were not to be construed as rules, certainly it has not been the general practice to recognize two such names as the above and the "Opinion" of the Commission which is in accord with the A. O. U. Code may well be accepted as settling this mooted question, so far as it goes.

Dr. Woodward's statement to the effect that no attempt is made by the Commission to go beyond the facts set forth by the appellant is surely based upon a misunderstanding. In two cases submitted by the present reviewer (*Grus* and *Colymbus*) Dr. Stejneger to whom they were referred made an exhaustive research and produced much additional evidence in the second case to overthrow my contention.

New forms described: *Trugon terrestris mayri* (p. 69) Hollandia, by Rothschild and *Sterna albifrons guineae* (p. 70) Loko, Benue, West Africa, by Bannerman. Also in No. CCC XLI X, March 27, 1931: *Apaloderma narina littoralis* (p. 80) from Sokoke Forest, Kenya, by van Someren.

Bulletin of the British Ornithologists' Club. CCCL. April 30, 1931.

An interesting paper on Breeding Displays of Certain Waders by Dr. P. H. Bahr occupies most of the number. There are also new forms described as follows: *Aethocorys personata intensa* (p. 100) Chanler's Falls, Nyiro River, Africa, by Rothschild; *Caprimulgus monticolus burmanicus* (p. 102) Upper Chindwin, Burma and *C. m. amoyensis* (p. 102) Amoy, S. E. China, by Stuart Baker.

British Birds. X XIV, No. 10. March 2, 1931.

An Ornithological Transect of the North Atlantic. By E. M. and B. D. Nicholson. Data on three crossings from England to British Guiana with map. Twelve species were noted, while a vast birdless area was found to exist between the Azores and Barbados.

Observations at Sewage Farms and Reservoirs, 1930. By T. A. Coward.

The Birth of a Black-headed Gull. By F. B. Kirkman.—A valuable study of the hatching of a wild species, most of our data, having been based upon young domestic chicks. The Gull required about 48 hours to sever the shell but young shore-birds, much more precocious in development, seem to hatch suddenly.

There are records of the recovery of a number of bands in the pellets and nests of Hawks and Owls.

British Birds. XXIV, No. 11. April, 1931.

Ornithological Report for Norfolk for 1930. By B. B. Riviere.

Field-Reflections on the Nesting, Songs and Cries of the British Marsh and Willow-Titmice. By John Walpole-Bond.

Also papers on the migratory movements of Wood Pigeons by T. J. Beeston and Green finches by A. W. Boyd, both bird banding studies.

British Birds. XXIV No. 12. May, 1931.

The Behaviour of Starlings in Winter. By V. C. Wynne-Edwards.—A valuable contribution to the study of roosts.

A short note presents a flashlight photograph of Wagtails roosting in a tree top in Dublin, some 600 birds! There is also a report of recoveries of banded birds.

The Oölogists' Record. XI, No. 1. March 2, 1931.

Field Work of the British Ornithologists' Union in 1930. By F. C. R. Jourdain.

Notes on a Visit to Algeria in 1930. By R. F. Meiklejohn.

On the Nesting of *Phalaropus lobatus* in Shetland. By W. E. Glegg.

Birds Observed in Angol, Chile. By D. S. Bullock.

The Bateleur. III, No. 1. January, 1931.

Notes on Egyptian Birds. By C. B. Ticehurst.

European Migrants in East Africa. By H. F. S[toneham].

Birds of Marsbit Mountain, Kenya Colony. By H. B. Sharpe.

A number of notes and some continued papers published in this journal lack authors' names which is unfortunate as it is troublesome to have to trace back the authorship to previous numbers.

The Emu. XXX, Part 4. April, 1931.

Notes on *Arses kaupi* and *Arses lorealis*. By N. J. Favaloro.—With a colored plate.

The Truth about the Lyrebird. By Tom Tregellas.—The author has spent seventeen years with the birds making a permanent camp of a great hollow log where the birds became perfectly accustomed to his presence. He has had Lyrebirds sitting on his table and on poles over his fireplace, and was able to study and photograph them in all their activities at very close quarters. His photographs illustrate the article.

Birds in the Biological Balance. By A. H. E. Mattingley.—A strong argument for the maintenance of the balance of Nature.

Further Notes on Ocean Derelicts. By F. Lawson Whitlock.—Notes on ten species of sea birds, mainly Petrels, washed up on the beach.

A May Visit to the Capricorn Islands. By W. D. K. Macgillivray.

The Satin Birds of National Park, N. S. W. By Norman Chaffer.—Excellent photographs of the birds and their bower.

There are many shorter articles and notes on various Australian birds.

The South Australian Ornithologist. XI, Parts 1 and 2. January and April, 1931.

Part 1 contains many notes on South Australian birds while Part 2 is largely devoted to an excellent article on the Nesting of the Banded Stilt with photographs showing vast numbers of these birds on their nesting grounds like great Tern colonies.

There is also an article on A Trip to Moolawatana. By A. M. Morgan.

Alauda. (Ser. II) III, No. 1. February, 1931. [In French.]

Besides local articles there are the following:

The Birds of the Sahara. By M. Hachisuka.

The Zosteropides. By Baron Snouckaert van Schauburg.—A list of all described forms.

The Persistence of *Comatibis eremita* in Algeria. By H. Heim de Balsac.

The Capture of Birds by Certain Phanerogamous Plants. By H. Heim de Balsac.—Caught by the prickly heads of thistles and burdocks and by the glutinous seeds of the tropical *Pisonia*.

L'Oiseau. XI, No. 12. December, 1931. [In French.]

Some Birds of Teheran. By M. Planiol.

A Plant Trap for Birds. By A. Hugues.—Goatsucker caught by the sticky stems of the grass, *Setaria verticillata*.

Conclusion of Vol. III of 'Les Oiseaux'—Turkeys, Megapodes and Tinamous.

L'Oiseau. (Nlle. serie) I, No. 1–2. January–February, 1931. [In French.]

This journal begins a new series with 1931 and is now apparently entirely separate from the 'Revue d'Histoire Naturelle' of which it was formerly a part.

Description of New Birds from Madagascar. By J. Delacour and J. Berlioz.—*Newtonia archboldi* (p. 1); *Randia* (gen. nov.) *pseudo-zosterops* (p. 3); *Foudia sakalava minor* (p. 4).—With a colored plate.

Observations on the Nidification of Birds in Algeria. By R. F. Meiklejohn.

On the Birds of the Philippines.—Revision of the Ground Pigeons. By M. Hachisuka. To be continued.

Some Considerations on the Migration of Birds. By F. Cathelin.

Mimicry from the artist's point of view. By R. Reboussin.

On Some Rare or Little Known Hummingbirds. By G. Rousseau-Decelle.

A short Visit to Abyssinia. By J. Delacour.

Notes on the Nidification in the Camargue of *Egretta g. garzetta*, *Nycticorax n. nycticorax*, and *Ardeola r. ralloides*. By L. Galet.

The Nuptial Flight of the Snipe. By R. Reboussin.

Note on *Centropus grilli*. By J. Berlioz.

Two Interesting Instances of Parasitism in the Cuckoo. By R. Peltre.

A New Stage in the Mutation *tenebrosus* of the Common Pheasant. By J. Delacour.

Ornithological Observations in Southern Algeria. By Ch. Arnault.

Bird Cages for the House. By M. Legendre. Continued in No. 3.

Bird Breeding and New Birds at Cleres. By J. Delacour.

L'Oiseau. I, No. 3. March, 1931. [In French.]

The Raven on the Isle Cezembre, France. By D. de Viville and R. Lami.

Contribution to the Distribution of West African Birds. By G. Bouet.—A list covering four trips to Senegal.

Ornithological Notes in the Camargue, in June, 1929 and June, 1930. By G. Olivier.

Journal fur Ornithologie. LXXIX, Heft 2. April, 1931. [In German.]

Birds of the Dauro-Manchurian Transition Country. By B. Stegman.—Completed.

On the Head Wattle of the Turkey. By A. Schneider.—A detailed investigation into its morphology and physiology.

Report on Bird Banding at Rossiten on 1925 and 1926. By J. Thienemann.

Biological Observations at the Nest of the Hooded Crow. By R. Kuhk.

Observations on the Hatching of a *Crax globicera* and a *Mitua mitu*. By O. Heinroth.—With illustrations of the young at various ages.

Ornithologische Monatsberichte. V, No. 2. March, 1931. [In German.]

The Rudimentary Hallux in Three-toed Woodpeckers. By H. Scharnke.

The Water "coursing" of the Skimmer (*Rynchops*). By H. Schildmacher.

Eumelanin and Phaeomelanin in the Bird Feather. By G. Steinbacher.

Six new races of birds from Celebes are described by Erwin Stresemann and three by W. Meise.

Der Vogelzug. II, No. 2. April, 1931. [In German.]

The Migrations of North Asiatic Birds. By A. Tugarinow.

On Bird routes in the North Sea Country. By R. Drost and E. Bock.

Many notes on bird banding and migration.

Beitrage zur Fortpflanzungsbiologie der Vögel. VII, No. 2. March, 1931. [In German.]

Observations at the Eyrie of the Pergrine Falcon (continued in No. 3). By L. Schuster.

On the Nesting Habits of *Panurus biarmicus*. By C. G. B. ten Kate.

Swallow Statistics. By C. Matthiessen.

Notes on Eggs and nests of various European birds.

Beitrage zur Fortpflanzungsbiologie der Vögel. VII, No. 3. May, 1931. [In German.]

On *Anser erythropus*. By Paul Rosenius. With photographs of nest and eggs.

Nesting observations on Some Birds of Mongolia. By H. Grote.

Notes on Some Birds' Eggs from Central Polynesia. By G. Timmermann.

OBITUARIES.

Dr. Spencer Trotter, a Member of the Union, died at his home in West Chester, Pa., on April 11, 1931, after a lingering illness. He was born in Philadelphia, on February 8, 1860, the only child of Newbold H. Trotter, an artist of note, and Annie Dawson Trotter.

He was educated at the Friends' Select School and Rugby Academy in Philadelphia and later graduated at the Medical School of the University of Pennsylvania, in 1883. He always had a deep interest in natural history, especially ornithology, and spent some time as a student on the Jessup fund at the Academy of Natural Sciences, helping to move the collection of birds from the old Museum at Broad and Sansom Sts., to the present building, and later cataloguing certain groups. He also had the pleasure of showing the birds to the noted British ornithologists, Philip L. Sclater and Osbert Salvin who visited this country at that time. Young Trotter was a cousin of Newbold T. Lawrence and used to visit him and collect birds on the beaches of Long Island while he collected assiduously about Philadelphia and secured many rare specimens from the noted taxidermist Chris. Wood whose shop he frequented. When in New York he visited the veteran ornithologist George N. Lawrence, the uncle of Newbold, who showed his collection to the boys and gave them much advice.

After graduating, Dr. Trotter served as resident physician in the Pennsylvania Hospital and practiced medicine for a short time and then in 1888 accepted the professorship of biology in Swarthmore College which he retained until a few years before his death, becoming the dean of the faculty. He did a good deal of lecturing outside the College and was for some years professor of zoology at the Wagner Institute in Philadelphia. His interest in the Academy of Natural Sciences never flagged and as years went on he served as Councillor, Curator, Librarian and Trustee, and was Director of the Ornithological Section.

He became an Associate of the Union in 1888 and was chosen a Member when that class was established in 1901.

He was one of the founders of the Delaware Valley Ornithological Club and served as president, 1904–1906.

While possessed of notable literary ability Trotter's time was so fully occupied with his teaching that his writings were unfortunately not very numerous. He published a text-book on geography, several essays in 'Popular Science Monthly' and a number of short papers and notes in the 'Bulletin of the Nuttall Club,' 'The Auk,' 'Bird Lore,' 'Cassinia,' etc. He never engaged in systematic research.

In later years he became deeply interested in geography and anthropology and was elected a fellow of the Royal Geographic Society.

During his earlier years he travelled but little, making a visit to the Pacific Coast and spending several summers in Nova Scotia. Later he visited Europe several times, extending his trips to the Hebrides, Orkneys and Iceland, and made a trip to Japan and China and from Singapore down

to Australia and New Zealand. Wherever he went he was alert for birds and presented the results of his observations in delightful communications before the Delaware Valley Club.

He was suddenly stricken in 1926 and although he partially recovered, and attended the Washington meeting of the Union in 1927, he never was able to take up his work again and for the last year was confined to his room.

Spencer Trotter had a delightful personality and was a brilliant speaker, inspiring his students to deeper interest in their work and ever suggesting to his associates possible lines of research or problems for investigation. To those who were fortunate enough to be with him on field trips or at meetings of the ornithological club his enthusiasm was contagious and by them and his many other friends his loss will be deeply felt.

He married, in 1889, Miss Laura Lee of West Chester, Pa., who, with his son Spencer Lee Trotter, survives him.—W. S.

JOHN GUILLE MILLAIS, a Corresponding Fellow of the American Ornithologists' Union since 1911, died on his 66th birthday, March 24, 1931, at Horsham, Sussex, England, as a result of an operation.

He was born in London, March 24, 1865, and was the 4th son of Sir John Everett Millais, P.R.A., from whom he inherited his artistic talents, and Euphemia Chalmers, daughter of George Gray of Perth. His education was received at Marlborough and Trinity College, Cambridge, and after three years' service in the militia in 1886 he joined the First Battalion of the Seaforth Highlanders. In 1892 he retired from the army to devote his time to his own pursuits, but during the great war he served with the Intelligence Department in Norway with the rank of Lieut. Commander, R.N.V.R.

Millais was a man of remarkable versatility and wide interests. He was not only a naturalist, traveler, big game hunter, and sportsman, but to these attributes he added those of an artist and sculptor and a deep interest in horticulture. His interest in birds began at an early age when as a boy of 13 he began to collect on the east coast of Scotland, and his collection of about 3000 British birds and big game trophies was housed in his private museum at Horsham, surrounded by the beautiful garden in which his skill as a horticulturist was well exemplified. He traveled in Iceland, Norway, central Europe, in Africa, and in North America from Alaska to Newfoundland.

To American ornithologists he is probably best known through his books on 'Game Birds and Shooting Sketches,' 1892; 'The Wildfowler in Scotland,' 1901; 'The Natural History of the British Surface-Feeding Ducks,' 1902; 'Newfoundland and its Untrodden Ways,' 1907; 'The Natural History of British Game Birds,' 1909; and 'British Diving Ducks,' 1913. In addition to these works are others of a more general nature, including 'A Breath from the Veldt,' 1895, containing an account of his early experiences in Africa; 'British Deer and Their Horns,' 1897; 'Mammals and Birds of

Great Britain and Ireland,' 1904–06; 'Wanderings and Memories,' 1919; 'Far Away up the Nile,' 1924; a monograph on the rhododendrons, a book on the magnolias, life and letters of his father, a biography of his friend Selous, and numerous contributions on big game and shooting. He also contributed articles on Black Game and Ptarmigan to the 'Encyclopaedia of Sport,' 1897–98 and illustrated the 1897 edition of Tegetmeier's Pheasants.

In 1886 he was elected a member of the British Ornithologists' Union and a Fellow of the Zoological Society of London, and in 1894 he married Frances Margaret, a daughter of P. G. Skipwith. He is survived by his wife, a daughter, and a son Raoul, who is also a talented artist.—T. S. P.

Henry Reginald Carey, an Associate of the Union since 1925, died suddenly on May 28, 1931, in Germantown, Philadelphia.

He was born in Epsom, England, September 12, 1890, the son of the late Arthur Astor Carey, a great grandson of John Jacob Astor, and Agnes Whiteside Carey, of England.

At the age of six weeks he was brought home by his parents to their home in Boston, Mass., and when he was eight years old the family moved to Cambridge, where Henry attended Browne and Nichols' preparatory school and later went to Milton Academy. He then entered Harvard University graduating with distinction in 1913, with the degree of A.B. and *cum laude* in Philosophy.

The following year he entered the United States Diplomatic Service and was for two and a half years head of the Passport Bureau in Paris. Other assigments in the service were at Panama, Mexico City and Bucharest.

On January 22, 1921, Carey married Margaret Bacon of Germantown, Philadelphia, where he later established his home. He spent a year in the business college of Columbia University and later entered the Law School of the University of Pennsylvania, being admitted to the bar in the fall of 1925. He decided not to practice law, however, but to devote himself to writing and in the ensuing years published a number of papers dealing mainly with natural history, the conservation of wild life, foreign affairs, and eugenics; his last work in the latter field being a translation of a French book on the falling birth rate of Rome during the time of Caesar Augustus.

Upon moving to Philadelphia, Carey joined the Delaware Valley Ornithological Club and became an Active Member contributing much to the success of the meetings and the field trips. He was also elected to membership in the Franklin Inn Club a noted writers' organization of Philadelphia. From early boyhood he was deeply interested in photography, especially of wild life with camera-trap and flash-light. He succeeded in securing very fine photographs of snowshoe rabbits in the Pocono Mountains, in winter, the drumming of the Ruffed Grouse (published in 'The Auk'), a fox in his runway, deer drinking at a woodland pool, etc. All of his

photographic plates and explanatory memoranda on his methods he bequeathed to the Academy of Natural Sciences of Philadelphia for the encouragement of the study of wild life through photography.

Unlike his great-great-grandfather, John Jacob Astor, who was such a prominent figure in the fur trade of his day, Henry Carey spent his energies in the opposite direction and was a very strong advocate of the conservation of the fur-bearers as well as wild life in general. He was a member of the Emergency Conservation Committee and took an active part in the efforts to save the big game of Africa from extermination by hunters.

"Rex" Carey as he was known to his associates possessed a delightful personality and was popular with all with whom he came in contact, and his passing in the fullness of young manhood is a sad blow to his many friends. He is survived by his widow, his mother and four small children. —Arthur C. Emlen.

George Irving Carpenter, an Associate of the American Ornithologists' Union since 1907, died at his home in Brooklyn, N. Y., in his 53rd year, on January 29, 1930. He was born in Stanfordville, Dutchess County, N. Y., April 3, 1877, the son of Charles H. and Tamar E. Carpenter, and from his early boyhood was interested in birds. His activities were chiefly concerned with local birds and he made a collection of the nests and eggs of the birds of Dutchess County. Unfortunately he does not seem to have published to any extent on birds and consequently his knowledge of the local avifauna was not made available to others.

By profession Mr. Carpenter was an expert accountant, and a member of the American Bankers' Association. He was also a member of the National Association of Audubon Societies, and the Brooklyn Institute of Arts and Sciences.—T. S. P.

Frank Watkins Commons, for many years an Associate of the American Ornithologists' Union, died at Minneapolis, Minnesota, on December 28, 1930. Born of Quaker stock at Wyoming, Delaware, on August 1, 1859, he was educated in Philadelphia, Pennsylvania, where he lived the greater part of his early life. Coming to Minneapolis, Minnesota, in 1882 he entered the grain business in association with his father and brother. After the death of the father the two brothers continued the business with offices in the Chamber of Commerce. In 1892 he married Miss Marie Andrews who survives him. Mrs. Commons had been interested in the study of birds from her girlhood and Mr. Commons becoming interested also after their marriage, a close companionship in nature study, with the study of birds as the major object, continued uninterruptedly thereafter. With the establishment of a beautiful home in the midst of a diversified thirty-three acre tract on the north shore of Lake Minnetonka, some fifteen miles west of Minneapolis, this became the focal point of many years of bird-study. Here, in 1923, the banding of birds was begun on an extensive scale and almost at once the "Tanager Hill Banding Station"

became one of the largest and most important stations in North America. The work was carried on in the most orderly and systematic manner, Mr. Commons bringing to bear the recording methods of an exacting man of business. Besides the regular reports and summaries sent to the Biological Survey at Washington, elaborate statistics and cross references were kept on special sheets prepared for personal use. This work is complete up to the time of Mr. Commons' death. In all of it Mrs. Commons took an equal and active part, her greater knowledge of birds being an important aid in determining doubtful species.

Mr. Frederick C. Lincoln, in charge of the bird banding work of the Biological Survey at Washington, wrote on learning of Mr. Commons' death: "I feel that this is not only a great personal loss but also the most serious one that we have sustained in the bird banding work, for as you know the Commons' station was one of the largest in the country."

The Commons' estate was an ideal place for bird study and for many years it was the Mecca for University of Minnesota and other bird classes. These groups, accompanied by their leaders, were always made welcome and Mr. and Mrs. Commons were ever the cordial and helpful host and hostess. In later years it provided an object lesson in bird banding for all who were interested and visitors never failed of a ready and responsive reception.

Mr. Commons was active in civic and business affairs, was at one time vice-president of the Minneapolis Chamber of Commerce, and for many years served on its Board of Directors. In all his varied business connections he was most highly respected and admired by his associates. He was known as a man of the most scrupulously punctilious methods and of fair and sound judgment in deciding questions of policy. The firm and later company of which he was, after the death of his father, the senior member, always ranked among the highest in business circles.

Socially he had many sincere and devoted friends, to whom he was always loyal, companionable, and ever ready to grant assistance if needed. As a man he was the courteous gentleman always, with a refined and attractive personality and was possessed of a genial and affable nature that endeared him to all who had the good fortune to know him intimately.—T. S. R.

Edward Addison Everett, an Associate of the American Ornithologists' Union, died at his residence in Waseca, Minnesota, on November 27, 1928. He was born at Arene, Wisconsin, February 20, 1867. His parents moved to Waseca when he was less than a year old and he continued a resident of that place until his death. At an early age he became interested in birds, made a collection of mounted specimens, kept records, and for a time sent migration data to the Biological Survey at Washington, of which use has been made in recent years in compiling a history of Minnesota ornithology.

At the age of fifteen he entered his father's flour mill, was a partner and in full charge before he was twenty, and later became president of the firm

of Everett, Aughenbaugh and Company, merchant millers, which position he held until his retirement in 1926. His interest in birds never flagged but he was too engrossed in business to give them more than a passing thought. It was his dream that on retiring he would devote his entire time to ornithology and Boy Scout work. But when the time came he found himself physically incapacitated and was never able fully to realize his plans. He fitted up the third story of his commodious home as a meeting-place for both Boy and Girl Scouts, began making a museum for their use, established a bird banding station on the beautiful lakeside grounds around his home, made several visits to the University Museum in the interests of his revived bird-work, was a frequent correspondent on bird matters, and in every way struggled valiantly to realize his long cherished ideal. Had he lived a few years longer he would undoubtedly have accomplished much, as he was a man of intense energy and possessed the means and ability to carry through whatever projects he or others might inaugurate. His death was a great loss and a keen disappointment to the writer and his other bird-loving friends. He had become much interested in the work of the University Museum and his genial, enthusiastic, and whole-souled nature made him a most desirable friend and associate. The young people of Waseca, with whom he came in contact during his last years, adored and respected him.

After Mr. Everett's death it was found that he had left a will in which he bequeathed in trust to the University of Minnesota for the "Department of Birds" (meaning unquestionably the Museum of Natural History) a sum amounting to $740,000. But by the terms of the will the income will not come to the University until twenty years after the last of his childrens' children have died, which in all probability will not be for a hundred years or so! About the time the will must have been made the writer and Mr. Kilgore dined with Mr. Everett at his home in Waseca and a passing remark made by him at that time to the effect that he contemplated "helping you boys" now seems to have foreshadowed what was in his mind. But as things have turned out, it will not be the present staff but those in charge of the "department of birds" in the far future who will profit by the income from a million dollars or more. The University Board of Regents formally accepted the bequest on November 23, 1929.—T. S. R.

Correction. In the list of Deceased Members published in the 'The Auk' for April 1930 the names of Chester Barlow who died in 1902, and John Nathaniel Clark who died in 1903 were inadvertently included in the list of Deceased Associates instead of in the list of Deceased Members. Both were elected full members in 1901 and the fact was mentioned in their obituary notices. The long standing error was due to the fact that for several years after the establishment of the class of members both deceased Members and Associates were included in the same list. It was not until 1906 that separate lists of deceased Members and Associates were published and at that time the transfer of these two names to the new list was overlooked.

NOTES AND NEWS.

We are in receipt of a number of letters from members of the Union criticising the paper published in the April 'Auk,' on bird work of the Biological Survey, because of its failure to make any allusion to the destruction of birds in the West through poisoning operations directed against predatory mammals and rodents—a matter that would seem serious enough to engage the attention of any agency having to do with the conservation of wild life.

While it is evident that a large proportion of our members are alive to the situation we would call the attention of all to the paper by Dr. Jean M. Linsdale on the use of thallium in poisoning operations in California (Condor, May–June issue, 1931, pp. 92–106) and Dr. Grinnell's editorial comment (ibid., pp. 131–132).

We learn that "over one-third of the area of California is being subjected to repeated applications of a poison [thallium] to kill ground squirrels, so insidious and far-reaching in its effects as to threaten the existence within that whole area of important native birds, such as Mourning Doves and Valley Quail, as well as secondarily but even more certainly, of carnivorous birds and mammals generally." Reports from 116 witnesses covering about one per cent of the area poisoned show a total of 5204 dead birds and mammals other than squirrels, actually counted, and Dr. Grinnell estimates that means that during the past four years approximately 50,000,000 birds and mammals have been killed exclusive of the ground squirrels. Dr. Linsdale's figures cover 22 species of birds including 3314 Doves, 713 Quail, 82 Pheasants, 80 Wild Geese, 67 Meadow larks, etc. He explains moreover that his informants are not in any way biased "few of them have any trace of sentimental prejudice in favor of any kind of wild animal" and "many hold the opinion that squirrels should be poisoned even if every other wild animal is killed."

The total area poisoned during the year ending June 30, 1929, was (according to the Tenth Annual Report of the California Department of Agriculture, as quoted by Dr. Grinnell) 5,000,000 acres involving 558,000 pounds of thallium poisoned grain while in the year 1928 Dr. Linsdale tells us that 2,000,000 pounds of poisoned grain were used of which 602,728 pounds were thallium treated.

As Dr. Grinnell says "the pity of it is that these campaigns of destruction are carried on in coöperation with the Biological Survey, a governmental organization which we were brought up to believe, upon the best of grounds, was consecrated to the practice and encouragement of real conservation and nothing else."

For several years past the American Society of Mammalogists has been opposing the use of poison by the Biological Survey and several members appeared before the Agricultural Committee of the House of Representa-

tives to protest against the passage of the so called "Ten-year Coöperative Program" for the "control" by the U. S. Department of Agriculture of predatory and other wild animals injurious to agriculture, etc. In spite of their protests and a written protest signed by nearly one hundred leading zoologists, the campaign backed by the wool growers of the West and approved by the Biological Survey was authorized though, as we understand it, the appropriation of $1,000,000 each year has to await the next congress. In the course of the hearing on the bill Hon. Charles Adkins, of Illinois, asked "In your putting out of the poison to destroy the rodents are you denuding the country of all other animals that eat that poison?" and Mr. Henderson of the Biological Survey answered "No, sir. The rodent poison is usually poisoned steamed crushed oats and the poison is placed in small amounts near the holes of the rodents. Many of the birds are not attracted by oats, as well as they are by other grains. The charges are made that we frequently destroy game birds with these poisoned oats. But Quail, Grouse and Pheasants have a marked immunity to strychnine, so they are rendered immune to this poison. To some extent some of the smaller birds have been poisoned. (Control of Predatory Animals. Hearing on H. R. 9599, pp. 39–40.)

This was on April 30, 1930 after thousands of pounds of thallium had been used in squirrel poisoning in California and yet no mention of this poison and its disastrous effect on birds was made before the Committee. It would seem that the Biological Survey was not aware of this! At any rate it is fully informed on the subject *now*, and the least it can do is to put its foot down firmly on any further use of thallium.

It seems to us that it is impossible for an agency actively interested in the conservation of wild life to be at the same time actively engaged in its destruction and it is deplorable that the Biological Survey which has done and still is doing such admirable work on various scientific and economic problems should be involved in this wretched business of destroying life.

This matter could well be left to the individual states which, as it is, bear the bulk of the expense, and let their citizens, only a small proportion of whom favor this destruction of wild life for private gain, take up the matter with their legislatures. Some states have already passed laws regulating or forbidding the use of poison, believing apparently in the statement of Mr. H. L. Stoddard, a member by the way, of the Biological Survey staff that "If for any reason poisoning is considered undesirable cotton rats may readily be trapped *although trapping is more cumbersome and expensive*" [italics ours] (cf. his 'The Bobwhite Quail,' reviewed on p. 444, *antea*.)

By its present activity in adopting and encouraging the poison method the Survey is being brought into disrepute to an extent that its officers apparently do not realize and we sincerely hope that it may abandon at once any further participation in this nefarious work.

We should advise those of our members who have written us, to take up this matter in their local press and with their Congressmen in order to make clear to the public and to Congress just what these poison campaigns mean and to encourage State action before it is too late. If every member of the Union secures the publication of at least one letter, or possibly an editorial, in the newspapers of his town or city the way will be paved for further action.

The 'St. Louis Star' has been taking up the cause of wild life in excellent editorials, let our other leading papers do likewise.

Moreover let us not be misled into thinking that this matter of poisoning is a question for the West alone. In a circular issued by the U. S. Department of Agriculture on May 4, 1931, announcing the authorization by Congress of the "Ten Year Program" we are informed that "in many eastern states also, increased efforts will be exerted for the control of rodents," while Mr. Henderson, in further testimony at the hearing of H. R. 9599, above referred to, said that the Survey has now one man stationed in Pennsylvania and proposes to have other men there under the "Ten Year Program," while for rodent work in the eastern United States, he stated, there will be an increase of appropriation "from $19,097 to $88,200" (pp. 41–43).

It looks as if this "Ten Year Program" would be as disastrous to wild life in America as the Russian "Five Year Plan" bids fair to be to human life in Russia, if not in the world at large.

We should also emphasize Mr. Redington's closing remarks in his paper in the April 'Auk' when he says "We (the Biological Survey) need all possible support from agencies interested in helping the bird or other animal to live" or again "An influence that has exerted all too little force is the appeal of the bird itself" and further "To give the bird the benefit of the doubt in all cases where there is a difference of opinion is our desire and our plain duty." Mr. Redington is undoubtedly perfectly sincere in this and we doubt if he was aware of the destruction of bird life that was going on in California when he wrote his paper. Therefore let our Committee on Bird Protection take up with his appeal and promise of coöperation, and find out exactly what the Survey proposes to do in the face of this destruction of bird life in California, which has been going on also in other states in lesser degree.

If ever the "appeal of the bird itself" needs our support it does so now.

The Brodie Club of Ontario, Toronto, has published a circular combating a similar circular distributed by Jack Miner entitled "Facts about Hawks" pointing out that his statements are not based upon stomach analyses and that in other matters he is mistaken. A still better service to the Hawks and Owls is a series of sketches of the various species written by the Club members and based upon reliable scientific information and published in the "Toronto Globe." We have always contended that the daily press is the best medium through which to further the protection of wild life.

THE FOLLOWING request from a European taxidermist has recently come to our attention, translated it reads: "Please let me know whether there are American books dealing with taxidermy and whether it is possible to procure in this country skins of Great Horned Owls. At the present time I buy 500 of these skins per year for the manufacture of decoy-birds, but the exhaustion of the stocks of European dealers in feathers obliges me to cease this manufacture."

Obviously the Hawks are having a bad time of it abroad as well as at the hands of game commissions in America.

WE LEARN that the Carnegie Museum Expedition to northern Manitoba including J. B. Semple and George M. Sutton has reached Churchill on Hudson Bay.

THE LAST Heath Hen was trapped and banded on Marthas Vineyard Island on April 1, 1931, when he visited the meadow on the farm of James Green, the ancestral booming field. He was immediately liberated in his favorite retreat among the scrub oaks, the last of his race since December 8, 1928.

THE SIXTH Annual Meeting of the Cooper Ornithological Club was held at Berkeley, California, May 15–17, 1931 when an interesting program was presented before a representative attendance.

DR. ALEXANDER WETMORE and Mr. F. C. Lincoln who have been on an expedition to Haiti returned on June 1 after a most successful trip. Dr. James P. Chapin who has been in Africa for some time has also returned with additional specimens and information upon the bird life of that continent.

WE WOULD again call attention to the Detroit meeting of the Union which will take place October 19–23 next. It is none too soon to make arrangements to be free to take the trip at that time. These annual meetings are an inspiration to all who are able to attend and this one occurring in a city not before selected as a meeting place will make it possible for many members to attend who have not heretofore been present.

THE EDITOR wishes to acknowledge the kind assistance of Dr. T. S. Palmer and Mr. William Vogt who have read most of the proof of this issue.

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